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VAGINAL HYSTERECTOMY

WENDELL LONG, M.D., F.A.C.S.
OKLAHOMA CITY

In the minds of many, vaginal hysterectomy is associated with memories of operative hemorrhage, urinary or fecal fistulae, and vaginal herniation. Others retain thoughts of the application of large crushing clamps, to be removed in forty-eight hours, and the wound allowed to heal by slough and secondary intention.

Refinements in technic and careful selection of cases have greatly altered this situation, and vaginal hysterectomy is definitely the procedure of choice in a small percentage of the cases requiring hysterectomy. However, it is well to add that the performance of this operation requires greater skill, more thorough knowledge of pelvic anatomy, and more experience than does the average abdominal hysterectomy.

The abdominal operation, for reasons of greater exposure, is certainly to be preferred in the large majority of cases needing hysterectomy. However, certain advantages to the vaginal approach give vaginal hysterectomy a small but distinct field of usefulness, which should not be denied.

DISADVANTAGES ASSOCIATED WITH VAGINAL HYSTERECTOMY

1. *Small Operative Field.* This is a distinct disadvantage. However, it is greatly diminished by proper retractors and assistants. With this preparation, the operative field is adequate for each step of the operative procedure, but the exposure must be changed frequently as the operation advances. This differs from the abdominal operation where the actual area of operative procedure is small, but the exposure of the entire operation is maintained throughout. Therefore, the smaller exposure, while a definite disadvantage, is not so great as supposed if the operation is performed in an orderly manner with the assistance of good retraction.

2. *Operative Hemorrhage.* In the modern operation, hemorrhage from the broad ligament is controlled either by primary suture ligation or by clamp and ligation. If these sutures are cut and the stump of the broad ligament allowed to fall back into the peritoneal cavity, control of subsequent possible hemorrhage becomes a difficult, rather blind procedure. These sutures must be fixed so as not to slip and be held, preferably with different types of forceps for different parts of the broad ligament for purposes of identification. If this is done, even with unexpected operative hemorrhage, each broad ligament stump may easily be exposed in its entire length and areas of hemorrhage controlled by suture.

To overcome the dangers of postoperative hemorrhage, the peritoneum is closed above the stumps of the broad ligament, with all the possible areas of broad ligament hemorrhage to be in the vagina. If hemorrhage should occur, vaginal packing will control it.

Thus, while hemorrhage in the vaginal operation is a greater danger than in the abdominal route, these simple tricks of technic make it negligible.

3. *Injury to Bladder, Rectum and Ureters* is a dangerous possibility which exists in the performance of complete hysterectomy either vaginal or abdominal. With as thorough an understanding of the vaginal operation as the abdominal, it occurs no more frequently. Injuries to these

structures take place either because of their distortion by the pelvic pathology or because of hurried and blind attempts to control hemorrhage with accidental injury. Proper selection of cases, thorough understanding of the anatomy, and knowledge of the tricks of technic make such injury possible but only rarely as in abdominal surgery.

4. *Herniation of Vagina Afterward* is rarely seen with the modern procedure because of the following precautions:

(a) Mobilization of bladder and suture of upper part of the broad ligament to pubo-cervical fascia and anterior vaginal wall beneath bladder, allowing the bladder to be supported in the sling so formed.

(b) Suture of broad ligament stumps together

(c) Suture of utero-sacral ligaments together.

(d) Colpoperineoplasty to form a protective bridge posteriorly.

5. *Disease of Tubes and Ovaries.* Pathology of tubes and ovaries is much better handled from the abdominal approach. Some enthusiasts even recommend vaginal operation for ruptured ectopic pregnancies. It would seem apparent that this is unwise. Simple adnexal disease, encountered in vaginal hysterectomy, may be easily managed, but it is not the route of choice for pathology of the tubes and ovaries.

6. *Size of Uterus.* There are schemes for taking out per vagina uteri, large enough to reach the umbilicus, in a piecemeal manner. However, the very large uterus is a contraindication to vaginal hysterectomy unless there is tremendous advantage in so doing.

7. *Pelvic Adhesions* offer dangers in the vaginal approach and should contraindicate choice of this route. With care, vaginal hysterectomy may be satisfactorily performed with dense pelvic adhesions, but it is more blind and dangerous than the abdominal route and a grave disadvantage.

8. *Co-existence of Other Intra-abdominal Pathology* makes abdominal operation preferable, if it is not contra-indicated.

THE ADVANTAGES ASSOCIATED WITH VAGINAL HYSTERECTOMY

1. *Less Shock and Less Anesthesia.* There is surprisingly little operative reaction from vaginal hysterectomy, particularly as compared with the abdominal operation. If general anesthesia is used only a very small amount is employed, as muscular relaxation is unnecessary. Local infiltration with novocaine offers excellent anesthesia for vaginal hysterectomy, and can be used where general anesthetic is not indicated.

These three things, less operative shock, reduced general anesthetic and satisfactory local infiltration novocaine anesthesia, are the greatest advantages of vaginal hysterectomy over the abdominal route. It makes this procedure desirable in the poor surgical risk, and in older and weaker patients, where abdominal operation would be a hazardous procedure. However, it must be pointed out that with modern aids, such as transfusion, many poor surgical risks may be greatly improved by proper preoperative preparation. Vaginal hysterectomy, nor any other operative procedure, is a substitute for as adequate preparation as possible.

2. *Ideal Operation in Complete Prolapse,* because it allows easy access to the structures which need repair. The bladder is supported in a sling made by the broad ligaments, the stumps of the broad ligaments sutured together, the utero-sacral ligaments approximated and a high colpoperineoplasty done.

This advantage is especially true in the small senile type uterus with greatly elongated prolapsed cervix.

3. *Shorter Morbidity* and earlier return to normal life makes it desirable.

4. *Avoidance of Disagreeable Symptoms of the Abdominal Operation* is advantageous. The patients after vaginal hysterectomy have little postoperative discomfort, usually no more than after simple perineorrhaphy.

5. *No Abdominal Scar and Few If Any Peritoneal Adhesions* make this procedure desirable.

6. *No Contamination Peritoneal Cavity by Carrying the Cervix Across It.* While this is given as an advantage, it is our opinion that complete abdominal hysterectomy, carefully performed, will avoid such contamination.

THE INDICATIONS FOR VAGINAL HYSTERECTOMY may vary with experience and technical skill of the operator, but the following conditions must be considered:

1. *Uterine Prolapse.* None of the con-

traindications existing, vaginal hyterectomy is particularly adaptable in the two following situations:

(a) Complete prolapse of the senile uterus with cystocele and rectocele, for reasons given above. We know of no other operation which equals it in this condition.

(b) Prolapse and vaginal relaxation in women of the late child-bearing period, who require hysterectomy for other causes, such as menorrhagia or small fibroids. This is especially true if a chronically inflamed cervix also exists.

2. *Carcinoma of Corpus Uteri.* This has been considered by some as an indication for vaginal hysterectomy. The reason given by its advocates is less contamination of the peritoneal cavity. There is one grave difficulty to its application. Cancers of the corpus tend to extend into the uterine adnexae, which can be much more radically attacked from the abdomen. The fact that the soft corpus can be more gently handled by abdomen, a distinctly favorable factor in cancer, is also to be considered against the vaginal approach.

3. *Menorrhagia At or Near Menopause.* When blood loss makes permanent cessation of uterine bleeding imperative there are three choices in available procedure: abdominal hysterectomy, radiation and vaginal hysterectomy.

In a selected group, curettage and radiation is very satisfactory, largely due to short morbidity and reduced economic inconvenience. It has the great handicap in that there are so many contra-indications to its use that careful selection will eliminate all but a small per cent, if one wishes entirely satisfactory results. It has the additional disadvantage of destroying any remaining ovarian activity.

Abdominal hysterectomy remains preferred in the majority of these cases.

However, where the contra-indications to vaginal hysterectomy do not exist, it is an ideal procedure in those cases which should not be treated by radiation.

4. *Fibromyomata.* For reasons of greater exposure almost all of these cases should have abdominal operation, except where the principal condition is a prolapse or menorrhagia and small fibroids are incidental.

THE CONTRA-INDICATIONS TO VAGINAL HYSTERECTOMY

1. Major pathology of tubes and ovaries.

2. Very large uterus.

3. Pelvic adhesions.

4. Co-existant intra-abdominal pathology.

CONCLUSIONS

1. The technic of vaginal hysterectomy has been greatly refined.

2. This has tended to minimize the objections of small operative field, possible operative hemorrhage, possible injury to bladder, ureters or rectum, and subsequent herniation of vagina.

3. The distinct disadvantages and contra-indications to vaginal hysterectomy are major pathology of tubes and ovaries, the very large uterus, pelvic adhesions, and co-existant intra-abdominal pathology.

4. Advantages of vaginal hysterectomy are less operative shock, less necessary anesthesia, excellent approach for repair prolapsed uterus, shorter morbidity, absence of disagreeable symptoms of abdominal operation, no abdominal scar and fewer peritoneal adhesions.

5. Vaginal hysterectomy is a particularly valuable procedure for the poor surgical risk and older and weaker patients who require hysterectomy.

6. Indications for vaginal hysterectomy are the following, if above contra-indications are not present:

(a) Prolapse of uterus, particularly complete prolapse of senile uterus; and prolapse and vaginal relaxation in women in the late child-bearing period, who require hysterectomy for other causes, such as menorrhagia or small fibroids.

(b) Menorrhagia at or near the menopause where blood loss requires permanent cessation of uterine bleeding, and in whom radiation is not advisable and the contra-indications to vaginal hysterectomy are not present.

7. Abdominal hysterectomy still remains the procedure of choice in removing the uterus in the great majority of cases, but there is a distinct field for application of the vaginal operation.

DISCUSSION—*Dr. John F. Kuhn,* Professor

of Gynecology, Oklahoma School of Medicine.

I think this is a very important and timely paper. It is especially important at this time, since there seems to be a recrudescence of the vaginal route operation, and in this return of the swing of the pendulum, sight is lost of the indications and the contra-indications for this step.

This paper is an excellent summary of the whole procedure—it is, in fact, a warning that vaginal hysterectomy has a very limited field and that the surgeon undertaking it must be fully acquainted with the contra-indications, as well as the indications; that he must be completely equipped as to a full understanding of the anatomy and then must know the technique so well that he can accomplish all of the minute details of the operation.

Let me quote: "Refinements in technique and careful selection have altered this situation, i. e., operation, hemorrhage, urinary or fecal fistulae, vaginal herniation, and vaginal hysterectomy is definitely the procedure of choice in a *small* percentage of the cases requiring hysterectomy." However, it is well to add that the performance of this operation requires greater skill, more thorough knowledge of pelvic anatomy and more experience than does the average abdominal hysterectomy. I cannot help but quote the remark made by one of my preceptors whom I had assisted many times in doing vaginal hysterectomy. He said to me: "Doctor, as I grow older I find fewer and fewer indications for vaginal hysterectomy, and I know now that many of the cases we did while you were my assistant might have been better served by abdominal hysterectomy."

Let me call to your mind some other important matters relating to the choice of this operation. *Preoperative diagnosis* must be exact. Here, there can be no such thing as a slip-shod, incomplete and inexact method, as is so commonly seen. Ask yourself: Are there generalized pelvic adhesions, with possibly angulations of the intestines requiring careful attention? Is there an appendix incarcerated with a tube or ovary, which when liberated may flare up and require an abdominal operation to save life? Are you going to be able to utilize the omentum as a covering for denuded surfaces? Are you sure that you have firm enough ligamentous supports so that you can restore the pubo-sacral sling? And finally, are you absolutely certain that all of the patient's symptomatology is due to the condition for which vaginal hysterectomy is proposed?

Let me recite again the major contra-indications:

1. Major pathology of tubes and ovaries.
2. Very large uterus.
3. Pelvic adhesions.
4. Co-existant intra-abdominal pathology.

The choice of this operation must be made only by the fully experienced and fully equipped surgeon, and my thought in the final analysis is that "surgery cannot stand many more batterings and rebuffs, if we are to apply our art for the betterment of mankind." Badly chosen and poorly executed surgical operations have done more to discredit surgery than any other factor, and we must all see to it that discrediting conditions are stopped as soon as possible.

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AGRANULOCYTIC LEUKOPENIA: REPORT OF CASE SUCCESSFULLY TREATED WITH X-RAY AND SOME OBSERVATIONS ON EFFECT OF AMIDOPYRINE

Julien E. Benjamin and Joseph B. Biederman (Journal A. M. A., July 21, 1934), report a case of agranulocytosis which was apparently amenable to high voltage roentgen therapy. During a period of good health the patient was given 10 grains (0.65 Gm.) of amidopyrine under control. This produced all the symptoms of agranulopenia within forty-eight hours. The administration of acetylsalicylic and ally-isopropyl-barbituric acids caused no unfavorable symptoms. Intracutaneous, patch and passive transfer tests gave negative reactions. In this patient the effect of amidopyrine was not one of an atopic nature but of hyper-sensitivity to the drug with the hematopoietic system acting as the shock organ.

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A RATIONAL, NONSURGICAL TREATMENT FOR INTESTINAL FISTULAS

Frank R. Guido, Visalia, Calif. (Journal A. M. A., June 30, 1934), states that the persistence of intestinal fistulas is due to the proteolytic action of trypsin. Upper intestinal fistulas heal spontaneously only on rare occasions. High intestinal fistulas alone result in marked changes in the blood chemistry due to fluid losses and chloride depletion. The use of dressings soaked in tenth normal hydrochloric acid will neutralize the alkalinity of the intestinal juices and thus inhibit tryptic activity, resulting in closure of the fistula. The risk and poor results of operative intervention is eliminated by the use of tenth normal hydrochloric acid. The Potter method of treatment of intestinal fistulas is based on physiologic principles; it is without danger and should be tried in all cases.

SEPTICAEMIA

L. J. STARRY, M.D.
Department of Surgery, Oklahoma University Medical School
OKLAHOMA CITY

Since the time of Hippocrates we have been studying the major problem of blood stream infections and yet the mortality rate at the present time is something over seventy per cent. This statement may explain the necessity and timeliness of a discussion at this time. Although many of the factors relative to this subject are controversial, a brief consideration of the prevalence of the condition and the results we are obtaining in its treatment, will convince the thoughtful individual that there is some need for a more thorough consideration, more definite understanding, and a crystallization of the many ideas of treatment in the hope that better results may be forthcoming.

In this discussion the term septicaemia will be taken to mean the condition wherein we find viable micro-organisms in the blood stream or evidence of the effects of their activities on the various systems of the body. It shall not include the oftentermed "medical infections," such as typhoid fever and pneumonia, as well as "la grippe," which likewise is a septicaemia. For the purpose of clarity and brevity, only pyogenic infections will be considered. Many times there is a confusion of terms evidenced in such a presentation as this. It seems that this is due to a similarity in terms such as bacteraemia, pyaemia, sapremia and the like. All of these should be separated and distinguished at the outset in order to avoid confusion. By the term bacteraemia, we mean that certain micro-organisms are circulating in the blood stream; these need not be manifesting symptoms, however. Some authorities add the requisite that they should be also multiplying in the blood stream. I am at a loss to know how we are to determine whether or not they are really multiplying. Toxemia means that circulating toxins are present in the blood stream —a very, very common condition, by the way. Pyaemia means that there are infected emboli broken off, from areas of thrombophlebitis for instance, and that these may lodge anywhere in the body. Finally, by sapremia we mean the presence in the blood stream of elements which have been absorbed from necrotic tissue.

The most common bacteria which are found in the blood stream are the staphylococcus, the streptococcus and the colon bacillus. The meningococcus and the gonococcus may be isolated but much more rarely than the first mentioned. The human body, constructed as it is, possesses certain barriers to infection and to the invasion of pathological bacteria. The skin and mucous membranes are the first lines of resistance to invasion; therefore, when there is any break in these natural lines, we have the danger of further invasion of deeper structure and eventually entrance into the blood stream. It is this more or less typical course of phenomena which immediately initiates the protective reaction of the body forces. In the event that the body cannot respond effectively or completely we have conditions right for the production of the disease. It is believed therefore that septicaemia arises as a result of the combined synergistic conditions—broken natural barriers and lack of resistance on the part of the host; that is to say, a paralysis of the resisting mechanism.

This resisting mechanism primarily concerns the reticulo-endothelial system which has the ability and the power to combat such infections as those described. That it often does so without the production of signs and symptoms of disease, is quite evident, since, were this not true, the prevalence of septicaemia would be markedly increased. When the defense mechanism is adequate, such signs and symptoms are entirely absent or are very transitory. As evidence of this statement, consider the onset of primary osteomyelitis when the disease is first manifested following a trauma which creates an area of decreased resistance without any break in the barriers whatsoever. There must naturally be then pathologic bacteria present in the blood stream prior to the trauma, which have gone unrecognized.

From the foregoing, it may be seen that

septicaemia of itself cannot be an original condition but always must act as a complication of some original disease or injury. It is quite true that many times the original portal of entry has been so minute and trivial that no attention is given it and that only the initial chill and fever calls attention to the fact that the individual has been affected by the occurrence. We may be called on to treat septicaemia from three distinct aspects, namely: First, infected accidental wounds; second, accompanying idiopathic infection such as cellulitis, and third, through operations on infected areas.

In dealing with either or all of these aspects there is one startling and sudden occurrence which should immediately put us on guard against the invasion of the offending micro-organism—that is the chill. Under any conditions, the occurrence of a chill should not be lightly passed over, but its appearance is always of the utmost concern to the surgeon. It very strikingly and decisively tells us that there is trouble ahead in the treatment of septicaemia. There is no aid to be derived from a consideration of the period of incubation since that may be from a few hours to several days and in its variance lies its weakness as a dependable sign. Fever of course immediately follows or accompanies the rigor and with it there appears the usual generalized aching of the muscular system, and the feeling of weakness and discomfort. Should there be any doubt following the appearance of such a trend of symptoms, the later appearance of petechial hemorrhages of the skin will tell the story beyond doubt. These hemorrhages are not confined to the skin as a rule but appear also on the serous surfaces and in the lining of the intestinal tract. The petechia first appear in the bend of the elbow and then appear over the chest and the abdomen. The characteristic element of the fever is its daily remissions and occasional intermissions—this with the profuse sweating is quite characteristic of the septicaemia fever. Toward the middle of the course of the disease, marked delirium appears although characteristically enough in staphylococci septicaemia, we may have a very clear sensorium until at or near the end of life. Physical examination shows the liver and spleen both enlarged—the latter in all likelihood due to an effort to throw effective blood cells into the circulation to combat the infection. Excessive sweating, anorexia, and loss of weight are likewise characteristic signs.

It is in the examination of the blood that the final definite proof of the correct pathologic diagnosis is found. Clinical septicaemia may be seen with a constantly negative blood culture. One cannot be certain from a pathological sense unless the blood culture is positive for these various bacteria. This laboratory procedure may consume as much as twenty-two hours in the test but certainly one should not delay adequate supportive measures in the meantime. The blood count in itself is important—not so much as to the total number of reds or whites but in respect to the round cells in particular. In these cells we have some idea of the resistance of the host. When the round cells are adequate, it is an indication that the resistance is good; when they are decreased the opposite is true. Faced with a falling count in the total of these cells, the prognosis immediately becomes less hopeful. It should be pointed out here that the colon bacillus infection characteristically gives a low white count. In this we must be on our guard lest a diagnosis of active tuberculosis be made, especially the acute miliary type.

Of the various types which have been mentioned, it is quite true that the staphyloccic infections give the worse prognosis —next the various streptococcus strains and finally the colon bacillus infections will give the best prognosis. The first usually arises from some skin lesion which has been entirely untreated or improperly treated. Strept infections follow criminal abortions, angina and the like. The source of the colon bacillus infection is usually from the bowel or from bowel contaminations.

Now, in respect to treatment: In this, like in numerous other diseases, the best treatment after all is in prevention. Insofar as septicaemia is concerned this simply means keeping individual general and local resistance to the maximum point. It also implies that proper local treatment should be administered every break in the first line of resistance. Especially is this true in accidental wounds—where even the most trivial break should be regarded as a potential source of septicemia and be therefore completely and properly sterilized. In the treatment of infected wounds, and especially cellulitis, the characteristic restraint of the physician should be cultivated. Care should always be taken in the incision of localized infections that the pyogenic membrane be not incised since to do so would immediately break down

the limiting wall which nature has provided against the spread of infection.

In general we may say that any course of treatment should not be judged in one or two cases, since if such is true we may get satisfactory reports from the most bizarre methods and remedies. Just recently a journal published the results in the treatment of three cases (all favorable) and then added that in order to prove adequately the efficacy of any method one should treat the same type of infection in twins! The obvious impossibility of this as a practical test need not be emphasized.

Supportive treatment, consisting of intravenous glucose, high caloric diet, whiskey, subcutaneous saline and blood transfusions will do more good than any specific form of treatment. In the case of the whole blood transfusions we have not only a general remedy but also a specific stimulation of defense mechanism by the addition of blood salts and healthy cells from the reticulo-endothelial system. The effect of the various dyes and alcohol administered intravenously is on the defense mechanism of the body and decidedly not as sterilizing agents in the blood stream itself. It is not quite logical to assume that any agent of sufficient strength to kill bacteria in the blood stream would leave the individual blood cells unharmed.

Most recently the so-called immune therapy has been more prominent in the discussions of treatment of this condition. The use of the various specific sera is productive of such variable results that they are to be regarded as of undetermined usefulness at the present time. The so-called immune transfusions gives to the recipient whole blood which has been fortified by the vaccination of the donor with the specific organism which has been isolated from the patient's blood. This procedure is worthy of more study and trial than has been given it in this locality. Again, the use of bacteriophage appears to have in it some elements which may bring excellent results providing that the specific phage can be grown before the need for it no longer exists. The statement should be again made that the fortunate summation of natural resistance often turns the tide in favor of the patient and the particular remedy used at that time gets the credit for the cure.

In the past fourteen years there have been admitted to the University and St. Anthonys hospitals at Oklahoma City a total of 268 cases of septicaemia; of this total there has been 180 deaths, or a mortality of 67 per cent. These cases were divided in the following manner: Fifty-one cases of puerperal sepsis with twenty-six deaths, a rate of 58 per cent; forty-one cases of peripheral infections such as cellulitis, furuncles and carbuncles with twenty-nine deaths, a rate of 70 per cent; peritoneal abscesses principally appendiceal in origin twelve cases with ten deaths, a rate of 83 per cent; pelvic abscesses and other so-called internal abscesses, fifteen cases with thirteen deaths, a rate of 86 per cent; mastoid infections, seven cases with two deaths, or a rate of 28 per cent; thirty-five cases of osteomyelitis with thirty-one deaths, or a rate of 88 per cent; infections of the kidney, eight cases with one death, or a rate of 12 1-2 per cent (the lowest of all); five cases of angina with four deaths, a rate of 80 per cent; five cases of arthritis with four deaths, a rate of 80 per cent; thirty-seven cases of unknown primary pathology with sixteen deaths, a rate of 43 per cent, and one of empyema, two of Vincent's disease and three dental infections, all with a mortality rate of 100 per cent.

As a result of this discussion and these rather terrible figures, it would seem that the study of septicaemia is entitled to more effort and concentration than it has received in the past.

304 Osler Building.

R. B. DAVIS COCOMALT

Investigators who have made a special study of fatigue and general debility report that these conditions generally can be corrected by proper diet and rest.

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FASCIAL SPACE and BURSAL INFECTIONS of THE HAND

FRANK L. FLACK, M.D.
TULSA

When the usefulness and value of the hand is considered, the justification for a paper dealing with some of the common infections is reasonable. The hand, with the possible exception of the central nervous system, is perhaps the most complicated anatomically of any region of the body. A working knowledge of this anatomy is a *sine qua non* for the correct diagnosis and treatment of hand infections. The frequency and seriousness of hand infections has not been given sufficient attention. This is probably due to the fact that, regardless of the percentage of disabilities, these cases rarely die. An analysis of the records of the Industrial Board of Oklahoma shows that in 60,583 partial disabilities, 20 per cent are due to injuries and infections of the hand, and that in 884 complete disabilities 58 per cent are due to the same cause. A stockyards plant in Chicago reports 75 per cent of their hand disabilities follow infection and a large accident insurance company states that 20 per cent of their total hand liabilities arise from the same cause. In this short paper only fascial space infections will be considered. Subcutaneous infections, hang nails, and other common infections will not be discussed. Complete text books such as Fifield's, Kanavel's, and others have been written on this subject. I have nothing new or original to offer; I only intend to review some of the points in anatomy that have helped me in treating these cases.

The anatomy of the hand is complicated and is a large subject in itself. For a general working basis some of the elementary anatomical features may be mentioned. The functional value of the hand depends upon complete use of the median, ulnar, and radial nerves, a proper blood supply, the free motion of the tendons and muscles, and an intact bony system. The flexor tendons are the most important and are supplied by the median and ulnar nerves. The principal fascial spaces and bursae are the closed spaces about the terminal phalanges, the thenar space, the middle palmar space, the web spaces, the Parona's space, the ulnar bursa, and the radial bursa.

The most common infection in my experience has been an infection of the distal closed space. The peculiar anatomical arrangement of this space is of the greatest importance. Dense fascia encloses it on all sides. Radiating pieces of fascia extend from the periosteum to the skin dividing it into many separate compartments. A digital artery goes through this space on each side of the last phalanx. However, the entire phalanx is not shut off by these fibrous septa. The part that corresponds to the diaphysis is a closed space and the portion of the phalanx proximal to that is an open space. When infection occurs in this space oedema supervenes, thrombosis of the veins follows, and the blood supply is shut off. This results in a destruction of the diaphysis and it occurs rather rapidly.

Diagnosis: An infection in this space produces the usual signs of inflammation. The finger becomes red, hot, hard, and painful. The swelling is usually not so great because dense fascial tissue everywhere surrounds this area. The pain is, as a rule, throbbing in character. Pus may be present before fluctuation can be elicited. This is what is commonly called a felon. However, the formation of it is usually not due to a collection of pus starting under the periosteum but is more frequently due to a subcutaneous infection extending between these fibrous septa. It is quite well known that fluctuation is present in the pulp of a normal finger. Naturally, an early incision to relieve the tension, drain the pus, and save the blood supply is necessary. This incision should be made on the side or sides of the finger because in this way we are able to cut through these septa and secure proper drainage. No longer are incisions made through the middle of the finger because they do not produce efficient drainage; they cause a tender scar on the pressure bearing area, favor prolapse of tendons, and destroy the efficient sensory plexus of nerves on the palmar surface. It is to be remembered, however, that tendon sheaths are attached to the bases of the distal phalanges. For this reason the incisions must not extend far enough prox-

imal to open the tendon sheath as this would result in a purulent tenosynovitis and a spread of the infection to the other communicating spaces.

Thenar Space Infections: The thumb is, of course, the most important digit of the hand. Rarely should the thumb be amputated because, regardless of how stiff the thumb may be, it still has function. It can practically always be used as a point of opposition. This is not true of the fingers, which frequently must be amputated because they are in the way. Next to the thumb in value as a digit is the index finger. The diagnosis and treatment of infections of the thenar space are understood only as the anatomy in the region of the thumb and index finger is known. The thenar space, which is, of course, a potential space, is on the outer side of the metacarpal bone of the middle finger. Posteriorly are the adductor muscles; in front are the flexor tendons, the palmar fascia, the flexor longus pollicis tendon and the short muscles of the thumb. This space extends almost to the lower border to the anterior annular ligament proximally.

Diagnosis: Infections of the space usually follow penetrating wounds. It may be secondard to an extension from a middle palmar space abscess. The most frequent cause, however, is the extension to this space along the lumbrical canal of the index finger. The lumbrical muscles are surrounded by potential spaces or canals. Each lumbrical muscle arises from a tendon of the flexor profundus digitorum. The sheath surrounding the lumbrical muscle communicates with the sheath of the flexor tendon. The route the pus follows is that it ruptures through the proximal end of the sheath of the index finger into the space surrounding the lumbrical canal of this finger and then extends into the thenar space, the thenar space having an extension into the first lumbrical canal. The characteristic and principal finding is extensive swelling of the thenar eminence. The extent of this swelling is greater than that of an infection of the palmar space because the fascia covering the thenar space is the thinnest portion of the palmar fascia. Edema on the back of the hand is extensive. This is accounted for by the fact that the course of the lymphatics is directly toward the back of the hand. Movements of the thumb and index finger in uncomplicated thenar abscesses are comparatively painless. The reason for this is that no tendon sheath is involved or distended with pus. The treatment of this condition is incision and drainage. All the muscles of the thumb, with the exception of the adductor pollicis, are supplied by a motor branch of the median nerve. If an incision were to be made directly over the site of the greatest finding, quite naturally the motor branch of the median nerve would be severed.

A dorsal incision should be made parallel with and just to the radial side of the second metacarpal bone. From this incision forceps are inserted through the adductor transversus and drainage established by the use of a piece of rubber glove. This incision has the additional advantage of providing drainage for the dorsal thenar space which frequently becomes infected, due to pus extending over the outer side of the adductor transversus muscles. This also has the advantage of leaving no scar on the palmar surface of the hand.

Middle Palmar Space: The middle palmar space lies dorsal to the flexor tendons. The flexor tendons, their accompanying lumbrical muscles and the ulnar bursa are separated from the middle palmar space by a thin sheath of fibrous tissue. Very important anatomically is the relation of the lumbrical muscles and the canals corresponding to the middle, ring, and little fingers. The canals of the lumbrical muscles are potential spaces and form channels from the tendons of the flexor profundus to the radial sides of the dorsum of the hand where they are inserted. Also, they are closely connected with the web spaces between the fingers and may carry infection from the tendons to these web spaces. When pus in a lumbrical canal ruptures, the infection spreads upward when connected with the middle, ring, and little fingers, to the middle palmar space. When connected with the index finger, it spreads to the thenar space. It has frequently been demonstrated that radio opaque material, when injected under pressure into the middle palmar space, is continued into the lumbrical sheaths of the middle, ring and little fingers.

Diagnosis: Infection in this space results most frequently from crushing injuries, perforating wounds, or from infections extending along the lumbrical muscles of the third, fourth, and fifth fingers. Many other less frequent methods of infection exist. The usual signs of con-

stitutional involvement frequently are found. The edema present obliterates the concavity of the hand. Dorsal edema is extensive. We must, however, consider that the lymphatic extension is directed to the back of the hand and that edema is common and pus formation is rare. Incisions for drainage of the dorsum are seldom justified.

Treatment: Due to the fact that infection of this space is most frequent following infections of the lumbrical canals, the primary incision should be one aimed to drain the lumbrical space. When the hand is actively and forcibly extended, elevations appear between the fingers. This is due to the fact that the dense strips of palmar fascia are inserted into the digits between the lumbrical spaces. In the intervening spaces between these areas of palmar fascia the lumbrical canals project. Using this as a guide, an incision is made in the gap between the middle and little fingers in order to disclose the lumbrical muscle in its space. A blunt instrument is then passed along this lumbrical canal into the middle palmar space and the pus drained. A piece of rubber tissue is inserted. Of course, rubber tubing is never used for drainage in the hand. Gauze is better for the reason that gauze promotes the formation of fibrous tissue and healing whereas rubber drainage promotes an exudation with the formation of a wall around the rubber drainage and delays healing. Occasionally, it is advisable to open the other lumbrical canals and secure drainage.

Webb Spaces: Between the bases of the proximal phalanges is a considerable amount of loose connective tissue. The lumbrical canals, in their course from their origin from the flexor profundi tendons to their insertion into the extensor tendons, pass through these spaces. In this way the middle palmar space, the thenar space, and the dorsal tissue of the hand are connected. For this reason an infection in the web space is a frequent source of infection in the palmar and thenar spaces. The web spaces are frequent sources of "collar button" abscesses. The treatment of these is adequate drainage.

Parona's Space: Another space of importance is the so-called Parona's space, or the deep forearm space. This space lies anterior to the pronator quadratus muscle and posterior to the flexor muscles; it is above the annular ligament and extends from just above the annular ligament approximately one-half of the way to the elbow. Infections in either the radial or the ulnar bursa, when not properly drained, rupture through the proximal ends and into this space. The findings produced by an infection in this area are swelling, redness, tender areas on the flexor surface of the forearm above the annular ligament. Practically always, an infection in the palm has produced this condition. If the abscesses in the palm have been properly incised and drained, an incision should be then made on each side of the forearm at the junction of the lower and middle thirds. This is deepened and extended just above the radius and ulna on either side. A hemostat is then passed through on top of the bones and rubber tissue drainage inserted.

Radial Bursa: The synovial sheath of the flexor longus pollicis tendon is quite extensive and is known as the radial bursa. This tendon runs beneath the muscles of the thumb. The radial bursa, being the sheath covering the long flexor of the thumb, is infected most frequently by the spread of inflammation which has started in this digit.

Diagnosis: Of importance in making the diagnosis is the discovery of a subcutaneous whitlow or puncture wound of the thumb with the signs of inflammation. The thumb is held in position of partial flexion. When the thumb is partially flexed, the space in the tendon sheath is increased to its maximum. This is the natural method of protection against the distention of the sheath by inflammatory material. This is done to relieve the pain. The thumb is enlarged. When efforts are made to extend the thumb, the pressure on the inflammatory material is increased and consequently pain is increased. Pain and tenderness over the anterior portion and over the entire extent of the radial bursa is present. Over the area of the muscles of the thumb there is definite swelling, but this oedema is not as great as in infections of the thenar space. The oedema over the back of the hand is not as great for the reason that the lymphatic supply is not as extensive nor as direct. Rupture through the proximal end of the radial bursa, which frequently takes place, empties the infection and pus into Parona's space of the forearm. For this reason an incision should be promptly made. The primary cause which is usually a thecal whitlow of the thumb should be properly drained by a lateral incision. This incision may then be extended up over the thenar space on its inner side.

To avoid destroying the motor branch of the median nerve supplying the muscles to the thumb, this incision should stop at least one and one-half inches below the distal wrist crease.

Ulnar Bursa: The deep and superficial flexor tendons are covered by a common synovial sheath. This sac is the ulnar bursa and lies principally to the median side of the tendons. The ulnar bursa is divided into three compartments. The most important is the retrotendinous portion. Of particular anatomical interest is the fact that the ulnar bursa is continuous with the synovial sheath of the little finger. In extent it reaches from the last palmar crease to just below the anterior annular ligament. In some instances it is continuous with Parona's space. An infection of the ulnar bursa in the majority of cases probably results from the extension of an infection of the little finger. The proximal ends of the radial and ulnar bursa are close together and separated by a very thin septum. In many cases an infection extends from the radial bursa directly to the ulnar bursa. Of course, perforating wounds and inflammations from other spaces may affect these spaces. The synovial membrane becomes thickened and the products of inflammation are poured out. This is the reason for the rapid production of adhesions in infections of the tendon sheaths. The formation of pus rapidly produces tension and if prompt and adequate incision is not done the tendons slough.

Diagnosis: The diagnostic points are the findings of a thecal whitlow of the little finger, pain and tenderness over the extent of the bursa; anterior swelling is not as prominent because of the over-lying tendons and the dense palmar fascia. Oedema and swelling on the dorsum of the hand is present and pronounced. Pain and inability to flex the fingers result because of the same reasons operative in infections of the radial bursa. Again, as in infections of the radial bursa, an infection of the ulnar bursa may rupture into Parona's space.

Treatment: If a thecal whitlow of the little finger is present, this should first be drained. The incision used to drain this is a lateral incision and may quite well be extended upwards. It may, with safety, be continued to the anterior annular ligament. The deep division of the ulnar nerve is not likely to be injured from this infection.

Lymphangitis: Lymphangitis, in most cases, is really a cellulitis. The most minute lesion frequently produces the most serious types of infections. In examining the case there may or may not be a small abrasion. However, if this is present it is usually surrounded by a red, swollen and tender area. The infection produces not only a lymphangitis but a perilymphangitis. The lymphatic vessels become swollen and are tender and, due to their redness, are easily visible and traced as red streaks running in a proximal direction. These lymphatics in the upper extremity pass with a remarkable degree of constancy depending upon their origin to the epitrochlear glands and the various groups of the axillary glands and often to the glands beneath the clavicle. The glands become swollen and tender. Due to the fact that the glands from the thumb, index, and middle finger drain to the superior glands, the infraclavicular and supraclavicular, a lymphatic infection originating here is more serious than one originating in the ring or little finger where the receiving glands are located lower.

Treatment: The principal thing in treatment is under no circumstances to operate. General treatment for the infection is carried out. The use of Bier's hyperemia by means of a constricting bandage left on for twelve hours, removed for one-half hour, and then replaced for twelve hours is of value. The extremity should be kept in continuous hot packs. I have never seen any advantage from the use of various antiseptics. Occasionally, abscesses develop and these, when they become localized, should be drained.

Illustrative Case: An illustrative case which came under my observation several months ago and one in which the patient possessed sufficient intelligence to give an excellent history, illuminates several points in the question of hand infection. This patient received an injury to his right thumb from having a piece of wire jabbed into the member. This injury was received over the palmar surface of the proximal interphalangeal joint. In this situation over the joint there is practically no subcutaneous tissue and the tendon sheath is just beneath the skin. Frequently in this location there is a hernial protrusion of a tendon sheath. Here is the most likely place to receive a direct infection of a tendon sheath. Four or five days later this man complained of pain and tenderness; the pain was made distinctly worse on flexion of the thumb. At

this time he had developed a tenosynovitis with pus in the sheath. The thumb was enlarged, was held in a flexed position, he could not extend it, and had great pain on passive motion. At this time the treatment would have been to make an incision into the tendon sheath on the lateral side and institute efficient drainage. In a few days the pain subsided. It was quite evident that the pus had ruptured or extended into some place where it had more room. Due to the fact that the radial bursa is the tendon sheath of the flexor longus pollicis muscle, this man, in all probability, had an infection of the radial bursa. Had the infection been in the other fingers, except the little finger, the pus would have burst through the proximal ends of the flexor tendon sheaths either into the middle palmar or thenar spaces. The next symptoms were those of infection of the radial bursa. Constitutional disturbances were added to the condition caused by an infection of the sheath of the flexor longus pollicis tendon with the addition of pain and tenderness over the site of the radial bursa. The patient continued to hold the thumb in a flexed position. At this state the hand should have been treated as outlined for the treatment of infection of the radial bursa. At this time it is quite likely that the tendon sheath had sloughed. The condition again seemed to subside. This was due to a rupture of the pus through the proximal end of the radial bursa into Parona's space. At this time the treatment for infection of Parona's space should have been instituted. The forearm became brawny and painful. About this time he was brought to St. John's Hospital. The constitutional symptoms were marked; his temperature was high; the patient was acutely ill; there was a marked swelling of the hand and forearm and he was delirious part of the time. The infection had ruptured also into the ulnar bursa. From the infection of the ulnar and radial bursa suppurative arthritis and destructive bone inflammation with degeneration of the carpal bones had taken place. An interesting point in the anatomy of the carpal bones is that the intercarpal-carpo-metacarpal and intermetacarpal sac is common to all the joints in the wrist. In other words, the wrist joint is, practically, one continuous sac so that the infection produced and resulted in a destruction of practically all the carpal bones. The tendons had sloughed and the treatment instituted was an amputation at the junction of the lower and middle thirds of the forearm.

This case illustrates quite well the continuous spreading inflammation through the various anatomical spaces of the hand. In addition to this, the hand had become stiff in a position of flexion.

If we anticipate the hand will be stiff, we must secure the position of optimum use which would be in position of dorsiflexion at the wrist with all the fingers slightly flexed and slightly separated. One needs only to place his hand in a position of flexion, the so-called Cotton-Loder's position, to see what a handicap results in its use.

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ALUM-PRECIPITATED DIPHTHERIA TOXOID: RAPIDITY OF IMMUNIZATION FOLLOWNG ONE DOSE

The results that A. E. Keller and W. S. Leathers, Nashville, Tenn. (Journal A. M. A., Aug. 18, 1934), obtained the injection of one dose of 1 cc. of alum-precipitated diphtheria toxoid indicate that immunity to diphtheria may be produced rapidly. In one group of twenty-three Schick positive children, 60 per cent were Schick negative in fourteen days. In he same group 95.6 per cent were Schick negative in twenty-eight days and 100 per cent in forty-two days after the injection. In another group of fifty-three children 92.4 per cent were Schick negative twenty-two days after receiving one injection of alum-precipitated diphtheria toxoid, 94.3 per cent were negative in sixty days, and 96.2 per cent were negative in ninety days after immunization. The results following immunization with a single dose of alum-precipitated diphtheria toxoid compare favorably with those obtained following two doses of toxoid without alum or toxoid with alum and are much better than those reported following one dose of toxoid without alum and with alum or three injections of standard diphtheria toxin-antitoxin mixture.

THE THERAPY OF THE COOK COUNTY HOSPITAL

Bernard Fantus, Chicago (Journal A. M. A., Aug. 18, 1934), presents the views of the therapy of fever as it is practiced by the attending staff of the Cook County Hospital. The first aim in the treatment of all fevers is causal therapy: i. e., the discovery of the nature of the exciting cause, and the application of whatever specific remedy there may be to jugulate it. Still, no matter what the name or nature of the causative organism is, the care and general management (regimen) of all fever patients is essentially the same. The article embodies a discussion of the following phases of treatment as it pertains to fever: rest, alimentary hygiene, antipyresis, elimination, relief of distress, combating pyrexial collapse and treatment of convalescence.

INDICATIONS AND CONTRA-INDICATIONS FOR SPLENECTOMY*

WANN LANGSTON, M.D., F.A.C.P.
Professor of Clinical Medicine, University of Oklahoma School of Medicine
OKLAHOMA CITY

I can open this discussion in no better way than to quote an eminent Scottish surgeon, Professor David P. D. Wilkie of Edinburgh, who, in an article in the American Journal of Surgery, in 1931, says: "There are few procedures in surgery which are girt about with such interesting problems as is the operation of splenectomy. The removal of an organ, the functions of which are not yet fully understood and the enlargements of which are beset by such intricate and varied blood dyscrasias, is in every case a fascinating experiment and offers a field for most intimate cooperation between the surgeon and the hematologist.'"

Inasmuch as the subject I have chosen is entirely too big for a brief discussion, since to cover it adequately one must go into the differentation of the entire field of blood dyscrasias in which there is splenic involvement; into the differential diagnosis of purpura; and into a careful consideration of diseases of the spleen with splenomegaly, I shall quote again from Dr. Wilkie a terse statement in which I fully concur, and which, in my judgment, covers the entire field, aside from such definite surgical indications as abscess or trauma: "The three conditions in which splenectomy promises real relief are: splenic anemia, hemolytic jaundice, and chronic purpura."

At this point I desire to refer to the cases in which splenectomy has been done in the various hospitals of Oklahoma City, whose administrative officials and staffs have been very generous and courteous in permitting me to study their records for this discussion.

There have been twenty cases in all. Of these, four have been for trauma. All recovered following splenectomy. One of these was a case of myelogenous leucemia; operation had no effect on the blood dyscrasia. This patient died some four years after operation. There can be no question as to the surgical indications in rupture of the spleen.

Six cases were operated with a diagnosis of splenic anemia or Banti's disease. A study of the records show that three of these were recognized in the stage of splenic anemia, before the fully developed Banti's syndrome had been reached. Two cases recovered; one died of exhaustion and hemorrhage nineteen days post operative.

The other three had reached the stage of cirrhosis, or Banti's syndrome; all died. One of these was complicated by biliary obstruction for a long period and died of exhaustion and cholemia.

These figures would indicate that splenic anemia offers a good prognosis, Banti's syndrome a very bad prognosis with splenectomy.

Three cases of hemolytic interus were operated, one a girl of about six years, a girl of sixteen, and a boy of nineteen. All recovered.

Six cases were operated with a diagnosis of thrombocytopenic purpura. An analysis of the records show three of these to have been chronic or recurrent purpura hemorrhagica with splenomegaly and thrombocytopenia. All recovered. One, a man of near sixty, is well eight years after operation; the other two were operated more recently.

One of the remaining three cases died five days after splenectomy. This case was acute; there was no splenomegaly; no history of recurrence or chronicity; there was a rapidly developing anemia, and while the record is not complete, one is led to recognize this as a case of myeloid insufficiency.

In the other two cases the condition definitely was myeloid insufficiency. Both died.

What, then, are the criteria on which one may base a judgment as to when to

*A clinical lecture given at the sectional meeting of the American College of Surgeons, Oklahoma City, Oklahoma, February 22, 1934.

remove the spleen in blood dyscrasias? May I quote again from the eminent surgeon already referred to, Professor Wilkie: "If by vital staining methods the blood be shown to contain large numbers of reticulocytes or young cells in the presence of well marked anemia with splenic enlargement, we may safely argue that a competent bone marrow is doing its best to make good for excessive red cell destruction and that in the latter process the enlarged spleen is in all probability playing the leading part. If, therefore, we remove the spleen we can hope for a rapid rise in red cell count and corresponding clinical improvement. If, on the other hand, the reticulocyte count is low and the anemia progressive, aplasia of the bone marrow is present and splenectomy offers little chance of bettering the patient's condition." To put it another way, three questions arise: First, is the bone marrow active? This can be determined with great accuracy today. The evidences of active myeloid function are signs of immaturity of the red cells, namely, nucleated cells, and more especially a high percentage of reticulocytes; a relatively normal number of thrombocytes, and a normal or increased granulocyte count.

The second question: Is there any evidence of splenic dysfunction? If there is splenomegaly in the presence of normally functioning bone marrow, with progressive anemia, thrombo-cytopenia, or hemolytic jaundice, one is justified in looking with suspicion upon the spleen.

The third question, if the bone marrow is active, and if the spleen is at fault: Can the patient undergo the operation with a reasonable degree of safety? In this connection I can only say that in my opinion, except in cases of trauma, splenectomy is an elective surgical procedure, and ample time may be taken to prepare the patient adequately.

Now let us examine these cases a little more critically, and apply as much as we can with the information obtainable, the principles which have been laid down above.

First, the group of splenic anemia. Formerly the term "splenic anemia" included a great variety of conditions characterized by anemia and splenomegaly. Gradually, as knowledge has accumulated, more and more of these cases have been placed in other categories, until now the term is reserved for that group of cases of insidious onset, chronicity, splenomegaly, tendency to gastro-intestinal hemorrhages, gradually progressive anemia and leucopenia, of unknown etiology; and usually terminating in portal cirrhosis, portal insufficiency and death. If the condition is recognized before cirrhosis develops the diagnosis of "splenic anemia" is made; if cirrhosis is present with portal insufficiency, the term Banti's disease, or better, Banti's syndrome, is applied. Of the six cases I have referred to above, three were cases of splenic anemia without portal incompetency. The results in two of these three were excellent; the other three had progressed to the stage of cirrhosis. These three died. Thus one sees that in this small group, splenectomy in splenic anemia offers a good prognosis; but when Banti's can be diagnosed the outcome is universally bad. This conforms to the observations of others who have had greater numbers to study.

The case I have to present is a thirteen-year-old boy, very anemic, as you can see. In 1926 he had measles, followed shortly by a profuse gastric hemorrhage. Since that time he has had several severe hemorrhages as well as some bleeding from the bowels. He was admitted to this hospital some eight months ago with the history of recent hemorrhage and enlargement of the abdomen. On examination he was found to have the characteristic type of anemia with leucopenia, spleno-hepaticomegaly with ascites, characteristic of Banti's syndrome. Paracentesis was done and several liters of transudate withdrawn. Remarkably, ascites has not recurred. We see him today with the following blood picture:

Hb.	60%
RBC	2,780,000
Reticulocytes	5.5%
WBC	3,650
N.	76%

evidencing adequate bone marrow activity. Splenomegaly is marked. Shall we recommend operation? Yes, exploration, although the history of ascites suggests cirrhosis already has occurred. There is now no evidence of portal obstruction; there is enlargement of the left lobe of the liver; and disabling anemia persists in spite of normal erythropoiesis. If the spleen is removable without too great hazard, recalling the ability of the liver to regenerate, one is justified in anticipating a favorable result, even now. Of course the outlook is not as good as it would have been five years ago. One must expect great difficulty at operation in this case because

of the high position of the spleen, and the probability of extensive adhesions.

Von Jaksch's anemia, Gaucher's disease, and perhaps refractory chronic recurrent malaria with splenomegaly, might be placed in the same category with splenic anemia.

The second group of cases, hemolytic icterus, congenital or acquired, will be illustrated by a single brief report.

E. H. A., an eighteen-year-old white male, entered my service January 4, 1932, with a history of continuous jaundice since the age of eleven, punctuated with remissions and exacerbations, the latter associated with severe abdominal pain and digestive disturbances. No family history of importance could be elicited. The condition seems to have had its onset in a severe acute abdominal crisis with jaundice, and the latter has persisted.

Upon examination this boy was jaundiced, anemic, and the spleen was enormously enlarged.

The composite blood picture was as follows:

Hb.	50%-56%
RBC	3,250,000-3,860,000
Reticulocytes	15.3%-18.8%
WBC	6,100-8,200
N.	60%-76%
E.	0%-4%
L.	24%-36%
Thrombocytes	280,000
Coagulation time	5-8 minutes
Bleeding time	2.5-3 minutes
Clot retraction, normal	
Fragility of red cells, increased	
Red cells smaller than normal	

BLOOD CHEMISTRY

N.P.N.	48 mg. per cent
Cholesterol	150 mg. per cent
Serum calcium	12 mg. per cent
Glucose tolerance test 91 mg., 158.8 mg., 136 mg.	
Icteric index	20-35 units
Van den Bergh:	
Direct, no reaction	
Indirect, 5-14 units, 2.5 mg., 7.9 mg.	
Urine essentially normal	
Basil metabolism	plus 14.5

X-ray of bones revealed the characteristic findings of the hemolytic anemias.

The diagnosis was obvious. In view of the continuous ill-health and recurrent severe episodes, and the fact that there were ample evidences of activity of bone marrow as well as excessive activity of the spleen, it was my judgment he should have a splenectomy. My surgical colleagues concurred, and he was transferred to the surgical service of Dr. R. M. Howard who did a splenectomy March 3, 1932. The result was as predicted. By March 10 the red count was normal; on April 1 it reached its peak of 5,820,000; on January 15, 1934, it was 5,390,000. His red cells are still more fragile than normal; the N. P. N. is still slightly elevated, but his general health is excellent. I present him today as an example of what may be accomplished by surgery in this type of case.

An interesting side light on this case is that he is one of the few cases of this condition complicated by genital and skeletal infantilism, and the only one in which both the hemolytic anemia and the infantilism have been corrected. But this phase will form the basis for another report.

Splenectomy has been recommended in the very similar condition of sickle cell anemia of negroes. Both favorable and unfavorable results have been reported; as well as one can determine from the reports, those who have responded favorably have been the cases with splenic enlargement. My small group consists of cases without splenomegaly, and I have not recommended splenectomy; however, as one can offer them nothing better, and as the ultimate prognosis is universally bad, I see no reason why splenectomy should not be offered the victims of this mysterious malady.

It is in the final group, in my opinion, where errors of judgment most frequently occur and tragedies result.

Purpura hemorrhagica is a symptom. In many instances it is associated with thrombocytopenia. This is spoken of as thrombocytopenic purpura. This phenomenon is a frequent accompaniment of the blood dyscrasias; it is the common occurrence in the terminal stages of the leucemias, sometimes pernicious anemia. It is a common manifestation in acute infectious or toxic conditions. It is my opinion, based on observation of a large series of cases, that the patients in whom purpura is associated with the blood dyscrasias mentioned will die, whatever is done; the acute cases associated with infections and toxemias will recover in a vast majority of cases without special treatment, or in spite of it, unless they die of the causative condition. In these cases of symptomatic purpura transfusion is the therapy of choice if any treatment of the hemorrhagic condition is required.

The bone marrow has three functions: The formation of thrombocytes, erythrocytes, and granular leucocytes. Any one

or two, or all three of these functions may be depressed, and to the extent that they are depressed we are dealing with impairment of myeloid function. Of these functions, that of thrombocytopoiesis is most frequently involved, and fortunately so; for it seems to be the least vital and the one that recovers most quickly and easily. When this function alone is depressed, and to the extent that only 40,000 or fewer platelets appear in the circulating blood, petechial hemorrhages are likely to appear. For the most part these cases recover spontaneously, without treatment, or with transfusions.

If one or the other of the remaining functions of the bone marrow be involved the condition becomes more serious. There may be a progressive anemia with low percentage of reticulocytes as well as absence of other signs of activity of the bone marrow. This means a grave situation and indicates definitely myeloid insufficiency. The same may be said with reference to the granulo-cytopenia which is sometimes associated with thrombo-cytopenia. If all three functions are depressed we are dealing with aplastic anemia which is almost universally fatal; and it is in connection with this condition that mistakes in diagnosis are most often made and disastrous operations undertaken. A brief case report will illustrate the point:

A fifty-one-year-old man was perfectly well until four weeks before admission to the hospital. Onset had been insiduous with pains in extremities, tenderness over sternum, hemorrhages from gums and gastro-intestinal tract, and petechial hemorrhages diffuse over body. Physical examination revealed pallor, purpuric phenomena, no splenomegaly. Temperature high. Red count around 2,500,00, Hb. 50%; *no reticulated cells;* platelet count around 25,000. White count varied from 14,000 to 26,000, with neutrophilic leucocytes varying from 0% to 4%. All the evidence pointed to culpability of the bone marrow, not of the spleen. Notwithstanding this, splenectomy was done. The patient died of hemorrhage.

I am showing you an identical case today except for the petechiae—a man of about thirty years, with profound anemia without reticulocytosis, thrombocytopenia, leucocytosis with marked granulocytopenia. He will die* in a few days or weeks in spite of what may be done. He has all the evidence of myeloid insufficiency. Splenectomy is definitely contraindicated.

*This patient died within two weeks.

Now, finally, there is a small group of cases in which splenectomy offers most brilliant and dramatic results, a group which must be most carefully differentiated from the cases just described.

Aside from bone marrow insufficiency, thrombocytopenia may result from destruction of platelets. It appears to be well established that the platelets normally are removed from the circulation by the reticulo-endothelial cells, particularly of the spleen. As is true with other organs, hyperactivity of the spleen is associated with hypertrophy of the organ. Consequently, if the thrombocytopenia is due to increased destruction of the thrombocytes one is justified in expecting enlargement of the spleen.

A brief case report will illustrate this group of cases: H. B., a five-year-old white boy, was admitted to the hospital March 9, 1933. Four months before he was supposed to have had "flu," during the course of which he had nose bleed. Recovery seemed complete, but in about a week epistaxis again appeared. These attacks occurred at intervals for two months as the child grew progressively weaker. During this period it was noted that the skin showed bruises more readily than is normal. Hemorrhagic spots would appear spontaneously.

Upon admission in addition to moderate anemia there was evidence of *active blood regeneration,* as will be seen from the following composite blood picture:

Hb.	35%-78%
RBC	1,750,000-4,410,000
Reticulocytes	3.8%-5.1%
Thrombocytes	20,000-30,000
Coagulation time	3 min.-7 min.
Bleeding time	20 min.
Clot	non retractile
WBC	4,200-9,400
N.	52%-82%

Purpura was marked. Splenomegaly was not noted; but when I first saw the case on March 29, splenic enlargement was definite. At that time I recommended conservative management with transfusions because of the acuteness and the recent onset, at the same time suggesting that splenectomy later might have to be resorted to.

During the next two months the condition fluctuated, but in general seemed to be progressive, the platelets remaining low, the red count remaining about the same, but always with a *high reticulocyte percentage,* around 5 per cent; and a normal leucocyte and differential count. On

April 21 it was my opinion splenectomy should be done. On May 13 it was decided to give some x-ray therapy over the long bones, which was done, a procedure which I believed to be contraindicated, for the reason that insofar as could be determined the bone marrow was in no way or degree at fault, and there was the additional danger of depressing bone marrow function. X-ray therapy more logically could have been aimed at the spleen, with some hope of success.

On June 14 Drs. Clymer and Collins accepted for operation. On that date the hemoglobin was 63 per cent, RBC 3,020,000, platelets 20,000. Operation was undertaken with fear and trembling on June 15. The result was dramatic beyond anyone's hope or expectation. Almost immediately improvement in the hemorrhagic condition was noted. By June 19 the blood picture was as follows:

Hb.	74%
RBC	4,410,000
Reticulocytes	0.5%
Thrombocytes	470,000
Coagulation time	4 min.
Bleeding time	3 min.
WBC	7,400
N.	74%

I had expected to have this case here today for demonstration but he was prevented from appearing because of measles in the family.

There is another case of splenomegaly which I am privileged to show you and consider whether the spleen should be removed. This condition you will recognize from the three classical findings, namely, splenomegaly, red cyanosis and polycythemia. Note the almost cherry redness of the hands and of the face, the cyanosis of the lips, the nose and the lobes of the ears; the spleen reaches almost to the crest of the ilium and to the mid line. The red blood cell count in round numbers is 8,000,000, the hemoglobin 140 per cent. He has all the associated symptoms of polycythemia rubra vera or Osler-Vaquez disease. Should his spleen be removed? There is evidence of bone marrow hyper-activity and there is hypertrophy of the spleen. I believe the splenomegaly is compensatory. Two functions of the spleen are the destruction of the red blood cells, and the furnishing of a reservoir to accommodate the excess of blood, although the latter statement has been questioned. Both functions in this case apparently are necessarily hyper-active in order to take care of the excess blood formed by the bone marrow. Some evidence of this is found in the fact that the size of the spleen was appreciably diminished when venesections (500 cc.-400 cc.) were done. So to remove the spleen in such a case would deprive the patient of his sole compensatory apparatus.

SUMMARY

In summary, then, when confronted with the question of the removal of the spleen, three questions arise:

1. Is there evidence of bone marrow activity? If not, operation is certainly not indicated. If the bone marrow is active—

2. Is the spleen probably responsible for the condition present? The most accurate index of splenic pathology is enlargement; the second, evidences of excessive hemolysis.

3. Does the patient's condition warrant operation?

If the answer is "yes" to all three questions, splenectomy is indicated.

Three conditions offer excellent prognosis following splenectomy; all three meet the requirements set out above:

1. Splenic anemia before Banti's syndrome is fully developed.

2. Hemolytic icterus which is causing chronic ill-health.

3. Chronic or recurrent thrombocytopenic purpura, especially if splenomegaly exists, when the life of the patient is repeatedly jeopardized.

Except in cases of trauma splenectomy is probably never an emergency. Several cases present are illustrative of these conclusions.

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THE ENDURING ACHIEVEMENTS OF SIR CHARLES BELL

Henry W. Woltman, Rochester, Minn (Journal A. M. A., Aug. 18, 1934), in discussing the life and work of Charles Bell, states that it was not only Bell's determined wish to carry forward the work of the Munros and the Hunters but that he felt that it was also his duty, and that he not only toiled industriously but with an all-consuming passion. Like the other Scots of London, he achieved fame, and he shared their traits. The author presents the salient points, as he sees them, from Bell's "Idea of a New Anatomy of the Brain." Herein Bell anticipates the later discoveries of cerebral localization. He states clearly what is now referred to as "the doctrine of specific nerve energies." The author discusses further Bell's various achievements in the physiology of the nerve system: Bell's palsy, external respiratory nerve, sign, muscle sense and Bell as teacher and clinician.

IMPORTANT PHYSICAL AND BIOLOGICAL PRINCIPLES IN RADIATION THERAPY

RALPH E. MYERS, M.D.
OKLAHOMA CITY

It sometimes seems that those who follow special fields in medicine occasionally read papers which are calculated to properly impress their fellow practitioners with the intracacies of their specialty. I'll admit that my subject sounds like a rather formidable one. However, I assure you that the basis of logical radiation therapy is built around easily understandable facts and concepts. To these I shall confine myself.

I believe it is axiomatic that the medical profession will wage a better fight against cancer in proportion to the improvement in general knowledge, not only regarding diagnosis, but also in relation to the problems of treatment, both by surgery and radiation therapy. I have been stimulated to write this paper by the erroneous ideas in regard to radiation treatment with which I frequently come in contact; ideas which are sometimes transmitted to patients by the referring doctor and which often cause misunderstandings. Occasionally patients come to me who have been treated elsewhere by methods which violate both physical and biological principles. Usually such treatments have been given by one who perhaps uses radium as a side issue to a rather general practice, but sometimes men of apparent experience seem to have lost sight of fundamental facts.

Unfortunately the wherewithal to buy, and not experience in its use, determines whether or not one can possess radium. Equally unfortunate is the apparent fact that some seem to feel the possession of radium confers upon them the Midas touch, with the result that sometimes its field of use is extended quite beyond its field of usefulness.

You are doubtless all aware that the Gamma rays of radium are much harder (shorter) than the Roentgen rays, even when a voltage of 200 Kv. is used. This means that a much higher percentage will be able to pass through the minute interstices which exist in all kinds of matter. In other words, much less absorption of Gamma rays than of x-rays will occur while passing through a certain distance of any substance such, for example, as body tissue. As one increases voltage the x-rays generated approach more and more closely to Gamma rays in hardness and accordingly in penetrability. In fact, if sufficiently high voltage can be used in generating x-rays, we would have the equivalent of Gamma rays. This explains the recent experimentation which has been going on in this country with voltages of 700 Kv. and even higher.

In spite of the much greater penetrability of Gamma rays over that of the x-rays ordinarily used in treatment, there is another fundamental physical concept which apparently is frequently lost sight of, but which very much restricts the logical use of radium. As we all know, the intensity of light varies inversely as the square of the distance from its source. The same law, of course, applies to the shorter wave lengths which we are discussing. Unfortunately, Gamma rays are generated so slowly that it is financially impossible to get enough radium together so that one can afford to place it at a distance from the body which is at all comparable to the distance commonly used in case of x-rays. When dealing with superficial lesions we are not interested in distance, but in the case of deep-seated lesions, unless we do use quite a little distance, a small area of skin must receive the dose which necessarily is distributed over a much larger area inside the body. Under such circumstances the cancer either receives an insignificant dose or else the skin suffers a most severe reaction.

Perhaps I can make my point clearer if I illustrate it by considering a specific lesion such as cancer of the tongue. This is frequently treated by some form of local application of radium around the site of the lesion and in addition a cross-fire radiation treatment from the outside. In the average individual the distance from the outside of the jaw to the center of the tongue is at least two inches, frequently more. With the ordinary amount of radium available, except in the large cancer centers, the rate of generation of Gamma rays is so slow that one can hardly afford to use a distance of more than one inch. Certainly two inches would be the absolute limit. If the distance from the skin was one inch, then the distance from

the radium to the center of the tongue would be three inches. Squaring these two figures, we find that the intensity of the rays reaching the center of the tongue is only 1-9th, or 11 per cent of that on the skin. This is making no allowance for absorption, which would be slight. In case a two-inch distance was used, even then the intensity at the center of the tongue could not be more than 25 per cent the intensity on the skin. X-rays are generated so rapidly that we can well afford a skin target distance of 25 to 30 inches. Even though the x-rays generated at 200 Kv. are much more easily absorbed than Gamma rays, it is possible by using such distance to deliver 65-70 per cent as much intensity to the center of the tongue as is attained on the area of skin through which the rays pass.

Undoubtedly it is much more commonplace to have a patient lie under a stream of x-rays than it is to fasten some radium on his face, especially if in the latter case we tickle his vanity a little by telling him how many thousand dollars he is carrying around with him and how we trust him with it. By properly using the magic "radium" we can doubtless also persuade him to put a higher value on our services, but as for the cancer cells, they will still respond only to efficient radiation.

Perhaps some of you will ask whether or not the shorter wave lengths are not more potent in destroying cancer cells than the longer ones. There is still room for experimentation before this can be answered with absolute certainty. However, evidence thus far available does not indicate such is the case. Packard[4] recently tested the effect of a wide range of x-ray beams (generated with a voltage of 12 Kv. up to 550 Kv.) on fly eggs and also on mouse tumor 180. He could detect no appreciable difference with the various wave lengths used.[5] It seems hardly reasonable to expect that further shortening of the wave length would bring any change in these results.

In my discussion of the biological side of this question my conclusions will be more closely applicable to epithelial than to other types of tumors, and more to internal than external growths.

It has long been known that the body tissues exert various types of reaction in the presence of the cancer process.[6] In front of the growing margin of carcinoma cells we commonly see large numbers of lymphocytes and plasma cells. Often cancer stimulates a very marked production of fibrous tissue. While ineffective, these are doubtless nature's reactions against the disease.[6] One of the effects of radiation therapy is to enhance some of these processes. In addition, it causes an endarteritis which tends to shut off the blood supply. But by far the most important effect of radiation is the more or less selective lethal action on the cancer cells themselves.

In the early days of x-ray treatment, when dosage was uncertain, safety demanded a fractional type of treatment. That is, treatments given with intervals of days, or weeks. Although many external malignancies were cured by this method, it is quite obvious that the intensity was never sufficient to go very far in cancer therapy. Often the growth became more and more radio-resistant until even a very intensive treatment could have no palliative effect.

With the advent of the Coolidge tube and better x-ray machines, dosage became much more accurate. About the same time a considerable knowledge of the action of radium was also being acquired. This naturally resulted in more intensive treatment accompanied by better results.

Shortly after the war when we were hearing wondrous tales of what the Germans were doing with their high voltage x-ray machines, two Germans [7, 8], Seitz and Wintz, began talking about a "sarcoma dose" and a "carcinoma dose". Generally speaking, sarcoma is rather unresponsive to radiation, but their "carcinoma dose" was not so fanciful. In fact, it seems quite certain today that any cancer can be destroyed if it is possible to administer a dose of sufficient intensity to all of the cancer cells. The important question is, can such a dose be administered without causing too great damage to normal tissue. Unfortunately, there is a more or less unpredictable variation in susceptibility of different cancers to radiation therapy. A small percentage of carcinomas will be cured by a dose of radiation decidedly below that which will have any marked effect on normal tissue. The majority, however, do not exhibit such radio-sensitivity. Instead, they show a variability of resistance to radiation up to the point where they are affected little, if any, more than normal tissue.

Since we cannot very accurately predict in advance the radio-sensitivity of a given tumor, we must in every case endeavor to administer the maximum dose that we feel we dare give. In other words, if

we are interested in curing as many cases as possible, we must carry our radiation to as great an intensity as we can without doing serious damage to the surrounding normal structures. If we overstep the bounds, we may cause severe suffering and other untoward results, but on the other hand, with inefficient radiation we can gamble away the last possible chance of a cure.

The "carcinoma dose" of Seitz and Wintz was an outgrowth of a rather inadequate experience built on some of the concepts which I have just expressed. At any rate, sufficient truth was evident that it spelled the end of fractional dosage and turned our attention to massive dosage. For a time many believed that the best method of treatment was to get the required dosage in as fast as possible. However, the severe systemic reactions frequently obtained proved a deterrent factor, so that radiologists began to give their massive doses more slowly.

About this time, due to the work of Regaud[1] and others, the theory began to evolve that cancer cells, like seminal epithelium, are actively multiplying cells which are more vulnerable to radiation during the period of mitosis. With this concept the logical thing then to do was to keep up a more continuous but prolonged radiation reaction of low intensity in an effort to catch all of the cancer cells during this vulnerable stage. At first this idea was chiefly applied to radium treatment, the radium being heavily filtered and used in small quantities. Later, largely as a result of the work of Coutard[2], much the same idea has been applied to x-rays.

The massive dose idea has not been thrown in the discard—quite the contrary. The dose is really more massive than it was before and in the end produces a fairly severe reaction. However, when given rather slowly, the differential between the effect on normal and cancer tissue seems to be increased over that evident in the short treatment. In other words, normal tissue recovers more rapidly from the effect of radiation than does cancer tissue with the result that by this method, so-called protracted treatment, there is a better chance of a lethal dose to the growth without overstepping the bounds of safety.

Before ending my discussion of the progress made in radiation therapy and the changing ideas regarding treatment, I am sure you will want to hear something about the very high voltage x-ray machines which are being used in a few places now. As yet, insufficient experience has been gained so that definite conclusions can be drawn. Some men think they have seen enough to warrant considerable optimism. At Memorial Hospital where they have been using 700 Kv. for about two years, they still wish to reserve judgment. When asked in regard to changes noted as compared to 200 Kv., they said it was quite evident that they could produce the same internal reaction with less effect on the skin than was the case with the lower voltage. This is what one would expect from the greater penetrability of the shorter wave length. It will obviously be some time before it will be known how much, if any, advance in treatment can be made by such high voltages.

When speaking of dosage, however we express it, we are primarily concerned with the decree of the biological reaction. We have long spoken of an erythema dose, and while such a dose varies quite a little in the hands of different men, and in the case of different patients, I am sure we will continue to think in terms of it. A few minutes ago I mentioned the variation in the susceptibility of carcinomas to radiation therapy.[3] Figuring on the basis of erythema doses a small percentage will respond to an intensity of reaction which is not more than two to four times the amount necessary to produce a faint erythema on the skin in the average individual. The majority of carcinomas, however, require much heavier dosage to destroy them. This dosage may run as high as seven to ten erythema doses—an amount which, under many conditions, cannot safely be given.

At this point let us turn our attention to what some of these limiting factors are. The uterus is especially suitable for radium treatment, and fully as important; it is a non-vital structure. On the other hand, a large number of internal cancers occur in vital structures or where vital structures would come in the path of treatment. Even if radium could be applied directly to the lesion, it would be out of the question to carry the reaction to a very high intensity. Cancer of the stomach is a good example of this. A malignancy here cannot be given a very heavy dose. Furthermore, it will very rarely respond to the amount of radiation which can safely be given.

Another very important point is the size of the area to be treated. If this is small,

we have a much better chance of administering the required dosage to destroy the cancer than if it is large. In the first place, treatment over a large area is likely to produce a profound systemic reaction as evidenced by nausea, vomiting, etc. Such symptoms, generally speaking, decrease in severity in proportion to the decrease in size of the area. Another important point is the endarteritis produced by radiation, a fact which I have already mentioned. If the severe disturbance of blood supply is limited to a small area while in the surrounding tissue it is little, if any, impaired, one need have little fear of untoward results. After a certain amount of dead tissue has sloughed out or been absorbed, nature will re-establish a blood supply from the surrounding healthy blood vessels. Perhaps I should mention an exception to this rule. One should always treat cautiously any area where there is a scar. Here the blood supply is already impaired. If much radiation endarteritis is brought about, an ulcer will be produced which will be very slow to heal.

Before passing on I wish to consider post-operative radiation for cancer of the breast in the light of the points just brought out. Of course, the indication for such treatment is the frequency with which the malignancy has spread beyond the operative bounds. Accordingly, radiation seems hardly justifiable unless a much larger area is taken in than was covered by the operation. With such a field to treat and with a large operative scar present, it is quite out of the question to produce a very severe reaction. Accordingly, if cancer cells are left following the operation, there is little chance of more than retarding their growth except in the exceedingly few cases where the cancer is very radio-sensitive. Simple logical reasoning indicates that post-operative radiation for cancer of the breast should not have very much to offer in the solution of this problem.

While small doses of x-ray often prove very beneficial in certain acute and chronic infectious processes, heavy radiation is decidedly contraindicated in such conditions. This is due to the lowering of tissue resistance which is thus brought about. Accordingly where infection exists with carcinoma, steps must be taken to clear up the former before active radiation is begun. This problem is frequently confronted in well advanced carcinoma of the cervix and sometimes in case of malignancies around the mouth. Unless the infection can be cleared up, the carcinoma will respond poorly and there is danger that the infection may be spread by the treatment.

Unfortunately there is another factor, especially prevalent in these times, which often makes adequate dosage a precarious thing to administer. One does not proceed far in the field of radiation therapy before he discovers that considerable loose talk about x-ray and radium burns can emanate from certain members of his own profession who are frequently also members of the State Medical Association. As always, the garrulousness of such individuals follows the inverse square law in relation to their knowledge of the subject. Since patients are unaware of this fact, it sometimes appears to be the better part of valor to administer the maximum dosage, when indicated, only to a selected group of patients.

No physician should ever use the term x-ray burn unless he intends to make trouble. If such are his purposes, he should not be allowed to longer remain a member of organized medicine, providing he already is one. When a competent radiologist produces rather severe changes in the skin or elsewhere in an intelligent effort to eradicate a malignant growth, such changes are properly termed reactions and should be spoken of only as such.

I shall now cite some cases from which I hope to illustrate a few of the points brought out:

Mrs. B. H. had a subtotal hysterectomy performed a little over seven years ago. The pathological examination revealed a carcinoma of the body of the uterus. She was advised to have some radiation treatment as soon as she recovered from the operation. However, because of the fear of great expense this advice was not followed. After a few months she began to bleed from the cervical stump; this compelled her to seek relief. She came to me in July, nearly seven years ago. While the cervix didn't look very bad, I visioned some malignancy sprinkled around the pelvis and thought only palliation was in store for her. Fearing some intestines might be very close to the base of the cervix, a moderate dose of radium was applied. (I have learned since that it is not necessary to be so cautious.) However, she was cross-fired very heavily with x-rays from four portals of entry. Since she was a very large woman, this could not have produced a very intensive reaction in the pelvis. To my great pleasure

and surprise this woman got well and has had no recurrence up to the present time, nearly seven years. She must have had a type of cancer which was very radio-sensitive.

Two years ago a white male, with a cancer of the jaw, applied for treatment. He stated that he had elsewhere received x-ray and radium treatments every two to six weeks for several months, but felt that he had gradually gotten worse. He said the radium treatments had been applied both inside and outside of his mouth. When he came to me it seemed evident he was losing ground rapidly.

Apart from the method used and the little or no palliation which had been produced, the simple fact that the treatments had been repeated so often with intervals between shows that at no time could there have been a reaction of much intensity. When a radiation reaction is carried to a sufficient intensity to warrant hope of a cure, it is not advisable to repeat it for from four to six months. In this case the frequent treatments had made the cancer so radio-resistant that even a massive dose could not have accomplished anything. Needless to say, there was no temptation luring me to take over this case.

Another recent case, a moderately advanced carcinoma of the cervix illustrates another point. This patient was referred to me two months after she had an initial dose of radium. While this dose was not very large, it had so contracted the vaginal vault by the time I saw her that it was impossible to expose the cervix. She had probably become somewhat radio-resistant, but in addition, the contractile changes had made it impossible to produce any very marked radiation reaction; such reaction had to be accomplished almost wholly by x-rays. As one might expect, not even a very satisfactory palliation was obtained.

At the present time the American Medical Association, through its council on Medical Education and Hospitals, is attempting to set certain standards for the practice of radiology. This is a very laudable aim and will doubtless help to put this specialty on a higher plane. Such efforts at regulation, however, can only partly solve the problem of more efficient radiation therapy. The great advance must come from a better general knowledge of this subject on the part of the average physician.

230 Osler Building.

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DISCUSSION—*Dr. M. B. Lhevine,* Tulsa, Oklahoma.

Mr. Chairman: Dr. Myers presented a very interesting and stimulating paper, and presented a difficult subject in a masterly manner. I have very little to add to this paper. I would like only to emphasize a few points.

First, as to the practicability of the higher voltages in the treatment of malignancies. This is yet a mooted question as to the value in the use of super voltage x-ray apparatus and radium packs. The biologic effect of large masses of radium and superpowered x-ray apparatus is not known as there are no definite biological results from the use of the latter on human beings as yet reported.

Dr. Carter Wood of New York claims that proper radiation with x-ray produced of 200 Kv. maximum voltage is equal to that given by the usual radium pack, is less hazardous biologically and even more beneficial than the proposed x-ray produced by supervoltage.

Dr. Myers calls attention to the radio sensitivity of different types of tumor and the intensity of the dose. The law of Bergonie and Tribondeu which was found to have a uniform application stated that tumors composed of rapidly multiplying cells, especially those of embryonal type and particularly those of the lymphoid group, are highly susceptible to radiation, because of the rapid multiplication of cells, loose structure and active metabolism. The adenocarcinomas and adenomas of glandular origin long tend to produce orderly glandular structures that resist radiation. Finally sarcomas of osteogenic

origin, all of which yield much intercellular material which resists radiation. The general condition of the patient has an important influence on the behavior of the tumor under treatment. There is a definite relation, not always uniform between grades of malignancy and radio sensitivity. All these matters require careful evaluation before radiation therapy can be intelligently conducted and its results predicted. A most important and remarkable phenomenon is the acquired resistance to radiation following successive inadequate dosage.

To the radio therapeutist a knowledge of the grades of malignancy and radiosensitivity is of the first importance. Knowing what radiation can or cannot accomplish, he will have a sound basis for planning treatment, both as to intensity of dosage and scope of the field to be irradiated. He will not attempt to destroy squamous carcinoma or osteogenic sarcoma with half erythema dose of external radiation.

Before I close my discussion I want to say a few words about treatment of cancer of the breast.

Preoperative irradiation has been justified on four grounds:

1. The classical experiment of Murphy and others in which cancer tissue grafted under the skin in a region previously submitted to an erythema dose of irradiation failed in a high percentage of cases, whereas, a fragment taken from the same tumor and given "cancer dose" of irradiation, grew as well as no irradiation graft when imbeded under the skin of another mouse.

2. Preoperative irradiation permits the taking of a biopsy without the risk of speeding up the malignant process or of implanting tumor cells in the skin wound.

3. Practical experience shows improvements in result.

4. By diminishing peri-tumeral infiltration may make an inoperable condition operable.

Postoperative irradiation is claimed to destroy cancer cells left behind at operation or not yet visible as metastasis. It is true that the rays may so lower the resistance of healthy tissues as to permit their being rapidly overrun by the cancer process. To guard against this, the patient's blood must be frequently checked. The most serious charge against post-operative irradiation of breast cancer is that of damaging the lungs. At present, safety is found in fractional dosage and as far as possible tangential irradiation.

There is no question as to its beneficial effects in local and distant recurrences, and in inoperable cases where it can prolong life and make the patient more comfortable.

CLOSING DISCUSSION: *Dr. Ralph E. Myers.*

In closing, I wish to emphasize the fallacy of giving x-ray or radium treatments with appreciable intervals between. In 1924, in a paper read at Chicago, Dr. Regaud of the Curie Hospital spoke as follows:

"The observations on human cancers, treated by radiation, have revealed another most important conclusion: The progressive decrease in radiosusceptibility of the cancer cells treated by repeated non-sterilizing irradiations. These ineffective irradiations will finally bring a necrosis of the treated region. This well-established fact forces us to adopt the rule of the single protracted treatment in human cancer."

This principle of treatment is accepted today by the leading radiologists as it was at that time. The changes which have been made are in the direction of greater intensity and of longer duration.

Only recently a method of treating cervical carcinoma was brought to my attention in which series of treatments were given at six weeks intervals with the radium treatment being separated from that of the roentgen rays. Obviously this violates the principles laid down above. The two types of treatments should be given together because by so doing the desired reaction is extended over a wider area. If the reaction is sufficiently intense to destroy the cancer, there is no need of further treatment. If it is not, the addition of more treatment after a period of six weeks will only make the cancer cells more radio-resistant and at the same time increase the damage to normal tissue.

Further progress in the cure of cancer can still be made with radium and the present 200 Kv. x-ray machines. This progress must come, however, from those who thoroughly understand the principles which underlie this type of treatment and who, therefore, can intelligently and with a reasonable degree of safety produce more intense reactions than are common today. Under-treatment rather than over-treatment is the present more prevalent error.

President's Page

LEROY LONG, M.D.
Medical Arts Building
OKLAHOMA CITY

DR. ROBERT C. COFFEY

This article is dedicated to the memory of an eminent surgeon through whose tragic death in an aeroplane accident last Fall the medical profession and the people of the world have been deprived of a peculiarly unique and most remarkable professional service. I refer to Dr. Robert C. Coffey, of Portland, Oregon.

Dr. Coffey and I were born in the same year and in the same state, but that is not why I speak of him here. We were students together in the same school, but that alone would not make it appropriate for me to speak. We were friends for many years, but even that, notwithstanding the store that I place upon it, is not the principal reason for my efforts to pay a tribute to his memory. No, it is not because we were born in the same state, nor because we studied medicine in the same school, nor yet because of the tender memories of a friendship that has done much to bear me up in my professional struggles. I have even a higher motive, for I speak of him because no man in my generation has done more, single-handed and alone, to solve some of the most difficult and disheartening problems in surgery.

Dr. Coffey received his preliminary education in a small school in North Carolina, and after that he taught school for a short time. While he was still a young man he entered Kentucky School of Medicine. This was a spring and summer school. When I entered Louisville Medical College Coffey was in the class taking what was then known as an unofficial course. It did not take me long to discover that three or four members of that class stood out far in advance of the other members of the class, and Robert C. Coffey stood at the head of those fortunate three or four.

Dr. Coffey was particularly interested in the study of anatomy. We had in that school at that time one of the greatest teachers of anatomy on the American continent, Dr. Clinton W. Kelly. Under the system then in vogue, the class in anatomy was divided into groups, each group being under a demonstrator selected from the advanced students. It was my good fortune to be placed in the group over which Coffey presided, and I shall never cease to be thankful for this remarkably important circumstance, because with the tremendous force of Clinton W. Kelly behind the department of anatomy and this virile young man in immediate charge of the group in which I worked, I was inspired with an ambition to know something about this tremendously important fundamental subject in medicine.

Parenthetically, it is interesting to reflect upon how much the future course of Dr. Coffey and his remarkable accomplishments in surgery depended upon the tremendous importance attached to anatomy in Louisville. Dr. Kelly had a powerful and dominating personality. He was so imbued with the importance of anatomy that it was to him a religious duty to instil into the students the principles of anatomy. When one scans the innovations in surgery made by Dr. Coffey, one is impressed with the fact that most of them are distinctly based upon anatomical knowledge.

After the completion of his professional training, Dr. Coffey located in a small town in Idaho, and worked there for several years. Even in those early days the profession in that section of the United States knew about his aggressive characteristics.

About the beginning of this century Coffey located in Portland, Oregon. Portland was then a very ordinary town. There was nothing about it that would stimulate original investigation more than hundreds of towns of the class to which Portland belonged. It would have been easy to have drifted along with the current, but Robert C. Coffey did not do that. He began a

series of investigations in a distinctly scientific way. On his own initiative, he laid down the foundation for the important work that he was to do during the next three decades. He built and equipped an animal hospital for research, and in that hospital he worked out many problems.

And Coffey did not choose easy problems. On the contrary, it would seem that he deliberately selected the most disheartening problems. He took up the question of cancer of the rectum and he systematized a technic that is followed, in whole or in part, by many surgeons all over the world. And then he took up the baffling condition of extrophy of the bladder which had never been relieved in a satisfactory way. By long and arduous investigation he finally perfected the technic through which the ureters may be transplanted into the large bowel in such a way that there is not regurgitation and disastrous back pressure upon the fatal infection of the kidneys. The technic that he perfected is now used successfully by surgeons everywhere, and it is the only practical procedure in connection with the relief of a condition that was formerly entirely irremediable, and usually fatal before the patient had advanced very far in his life career. If Coffey had not done anything else this triumph alone would place him among the immortals in medicine.

Coffey studied and wrote about many subjects. He presented definite plans for the treatment of intra-peritoneal infections, most of them having a distinct and important anatomical basis. His contributions to the study of cancer attracted favorable attention. His original technic in connection with the performance of the various intra-abdominal operations was clear and distinct. His contributions were so intelligent, succinct and forceful that for many years he has been quoted in the text books and current literature of medicine throughout the civilized world.

Coffey was a clean and wholesome man. He was particularly free from the petty and disastrous vices that men sometimes say are found in connection with genius. He, at least, was a genius whose work was initiated by clear thinking, right living, and stable procedure. I do not mean that he was a prude, because he had a sense of humor that helped to lighten the load that he carried all the time. But it was clean humor. I repeat that he was a wholesome man.

In my judgment, medicine of the world has not furnished a more striking example of what an intelligent and determined member of the medical profession may do, if he has a will to do, regardless of his location. The life work of Coffey in medicine demonstrates that any intelligent member of the profession may have, within himself, the principal requisites for success and usefulness.

Coffey is gone now, and I must say goodbye to my friend. As I think of his accomplishments, carried out under unfavorable circumstances by his indefatigable determination to succeed, I humbly bow at the shrine dedicated to his memory.

Oh, Coffey, thou who didst by thine own initiative hew out a place for thy work. Oh, Coffey, thou who didst do so much for the relief of those who had despaired of relief. Oh, Coffey, thou who didst stand "like a solitary statue in the City of God, while secret passages, running deep beneath external nature, gave thy soul intercourse with higher intelligences which strengthened and soothed thee, but of the existence of which those about thee didst not even dream."

PRESCRIBING OF DEXTROSE PHLEBOCLYSIS

Bernard Fantus, Chicago (Journal A. M. A., June 30, 1934), points out that in all very sick patients an adequate income of water, sodium chloride and dextrose should be taken care of as a routine procedure before rather than after a high degree of deficiency has occurred. This, in cases in which adequate oral administration is impossible, can generally best be accomplished by dextrose phleboclysis, the composition of which should be determined by the individual indications present. For combating hypohydration and for the relief of thirst, a 5 per cent solution of dextrose in distilled water seems preferable. Whenever salt starvation is threatened or present, dextrose-saline phleboclysis should be practiced. Whenever carbohydrate cannot be ingested or digested to a sufficient degree, 10 per cent dextrose phleboclysis should be resorted to. In poisoning with diffusible poisons, the diuretic and possible liver protective action of dextrose phleboclysis adds itself to the foregoing therapeutic values. Concentrated (25 per cent) dextrose solution may be of value in certain internal hemorrhages, in inflammatory and exudative pulmonary edema, to lessen intracranial pressure (unless there is cerebral hemorrhage) and possibly in myocardial weakness. During phleboclysis, other remedies may be conveniently infused; e. g., antiserums, epinephrine, insulin, iodide, sedatives and stimulants.

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DR. L. S. WILLOUR.....Editor-in-Chief
McAlester, Oklahoma.

DR. P. P. NESBITT.....Associate Editor
Medical Arts Building, Tulsa, Okla.

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Articles sent this Journal for publication and all those read at the annual meetings of the State Association are the sole property of this Journal. The Journal relies on each individual contributor's strict adherence to this well-known rule of medical journalism. In the event an article sent this Journal for publication is published before appearance in the Journal the manuscript will be returned to the writer.

Failure to receive The Journal should call for immediate notification of the editor, 203 Ainsworth Building, McAlester, Oklahoma.

Local news of possible interest to the medical profession, notes on removals, changes of addresses, births, deaths and weddings will be gratefully received.

Advertising of articles, drugs or compounds unapproved by the Council on Pharmacy of the A. M. A., will not be accepted.

Advertising rates will be suppied on application.

It is suggested that wherever possible members of the State Association should patronize our advertisers in preference to others as a matter of fair reciprocity.

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EDITORIAL

MEDICAL CARE OF THE INDIGENT SICK

Last November, at a special meeting of the Council, definite plans were outlined and a fee schedule submitted to the Federal Administrator, who at that time was Governor Murray, relative to the medical care of the indigent sick. As you know from previous editorial comments in these columns nothing was done by the Federal Administrator and it has never been arranged for the doctors of Oklahoma to receive any pay for this sort of service.

On August 13th there was a called meeting of the Committee on Medical Economics, held in Oklahoma City, and this matter was discussed. The committee visited a representative of Mr. Carl Giles, Federal Administrator, and he told us in no uncertain terms that it would be impossible for the Federal Administration to use any money for this purpose and until some money was appropriated by the state to assist in this Federal relief that no new avenues of expenditure would be opened.

At this time heads of families who are employed by the FERA are supposed to be self-supporting and are recognized as employed individuals; they will, consequently, be expected to pay for the maintenance of themselves and families, including medical care. The unemployable unemployed are at this time wards of their respective counties and the taxpayers are responsible for their support and medical care. This is the ruling of the Federal Administration.

The Committee on Medical Economics has decided to take this matter up with Mr. Hopkins, the National Administrator, advising him of the situation in this state as to the number of indigent sick to be cared for and the economic inability of the medical profession to continue to carry this load.

Whether or not any relief will be forthcoming from this source remains to be seen, but appears to be doubtful. In the face of the foregoing it would seem evident that the respective counties must square themselves to take care of the burden that has been borne through this emergency by the medical profession of the state.

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CONTRACT PRACTICE

There has been a great deal of discussion in the various county societies of the state relative to contract practice. Various members of the State Medical Association who have been doing work under contract have been criticized and some have been tried and various degrees of discipline instituted. The situation has been greatly clarified by the recent action of the House of Delegates of the American Medical Association in which contract practice has been definitely defined and is as follows:

> "By the term 'contract practice,' as applied to medicine, is meant the carrying out of an agreement between a physician or a group of physicians, as principals or agents, and a corporation, organization or individual, to

furnish partial or full medical services to a group or class of individuals for a definite sum or a fixed rate per capita.

"Contract practice per se is not unethical. However, certain features or conditions, if present, make a contract unethical, among which are: 1. When there is solicitation of patients, directly or indirectly. 2. When there is underbidding to secure the contract. 3. When the compensation is inadequate to assure good medical service. 4. When there is interference with reasonable competition in a community. 5. When free choice of a physician is prevented. 6. When the conditions of employment make it impossible to render adequate service to the patients. 7. When the contract, because of any of its provisions or practical results, is contrary to sound public policy.

"Each contract should be considered on its own merits and in the light of surrounding conditions. Judgment should not be obscured by immediate, temporary or local results. The descision as to its ethical or unethical nature must be based on the ultimate effect for good or ill on the people as a whole."

With this before you it would appear that these cases now may be handled in a more definite and certain manner.

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STATEMENT CONCERNING MATTERS INVOLVED IN A RESOLUTION SUBMITTED BY DR. HORACE REED TO THE HOUSE OF DELEGATES OF THE AMERICAN MEDICAL ASSOCIATION AT ITS CLEVELAND SESSION, 1934:

At the meeting of the House of Delegates, Tulsa, May, 1934, a resolution was introduced requesting the American Medical Association to give consideration to the matter of this organization writing protective insurance for the medical profession. This matter was prepared in the form of a resolution by the delegates and was submitted to the House of Delegates of the American Medical Association by Dr. Horace Reed. Below you will find a report on this subject by the Director of the Bureau of Legal Medicine and Legislation which we have published in full for your information:

"The American Medical Association cannot under its present articles of incorporation engage in the insurance business.

"The American Medical Association is incorporated under the laws of the State of Illinois, as a corporation not for profit. The object of the Association, as stated in its articles of incorporation, is to promote the science and art of medicine. The articles of incorporation do not authorize the Association to carry on an insurance business.

"The Board of Trustees of the American Medical Association could not properly use the funds of the Association for the purpose of promoting the organization and operation of a new insurance company or association, even for the purpose of indemnifying members of the Association against losses through malpractice, without a mandate of the membership so to do.

"Under the guise of an investment, the Board of Trustees might invest funds of the Association in the stock of a new and untried casualty insurance corporation or lend funds of the Association on the unsecured notes of a mutual insurance association, in the hope that some day the excess of premiums over losses through malpractice claims and expenses of administration might make the insurance corporation or association self-supporting. Such a course, however, would represent speculation, rather than investment, and would certainly not be consistent with good business judgment. No matter what the authority of the Board of Trustees may be with respect to such an investment or speculation, it would certainly not be expedient for them to embark on such an adventure without the expressed approval of the members of the Association.

"The American Medical Association is not organized to carry on the insurance business. To reorganize so as to qualify for that purpose would be difficult and expensive, and in the absence of reasonable certainty of corresponding returns would hardly be justifiable.

"Passing from the legal and financial aspect of this problem to the matter of expediency, it may be pointed out that the successful conduct of an insurance business requires an extensive organization, with highly specialized technical knowledge and skill, and that the Association does not now possess such an organization and could not easily gather one together without considerable cost. Moreover, unless the Association should be willing to carry on the insurance business by the mail order system, expensive compliance with the insurance laws of the several states would be necessary before the Association could as an insurance corporation function in them.

"The selection and rejection of insurance risks and the compromise and defense of claims based on alleged malpractice would involve the making of distinc-

tions among members of the Association that would tend to breed internal dissension.

"The harmonious operation of the American Medical Association and of its constituent state and county organizations would be jeopardized, if the Association entered on the insurance business, by the fact that the business of insurance requires the selection and retention of good risks and the avoidance and discharge of bad ones, and that the process of selection and rejection might easily introduce strife into the organization. Qualifications for membership in the Association are not necessarily the same as the qualifications of a good insurance risk, such as can be safely defended and indemnified against loss through claims based on alleged malpractice. If the Association should engage in the insurance business, it would sooner or later have to pass on the insurability of the several members of the Association and determine in many cases whether members should or should not be defended against claims made against them. The discrimination between insurable and defendable members and members neither insurable nor defendable would tend to lead to misunderstanding and hard feeling. A member denied the benefit of the Association's insurance service would hardly be satisfied with the denial, and he and his following would be discontented and constitute a focus of dissatisfaction in the Association. This would not promote harmony nor efficiency in the science and art of medicine or in the conduct of the business of insurance.

"If the American Medical Association should engage in the insurance business, it would be exposed to a volunerable point of attack by cultists, anti-vivisectionists, anti-vaccinationists, quacks, and offended vendors of fraudulent nostrums.

"If the Association should engage in the insurance business, directly or indirectly, cultists, anti-vivisectionists, anti-vaccinationists, quacks, and offended vendors of fraudulent nostrums might readily promote malpractice claims against members of the Association, for the purpose of weakening its financial position and destroying its good name. Every suit defended by the Association and lost would be represented by the enemies of the Association as efforts to justify malpractice and to deprive patients injured through the ignorance, negligence, unskilfulness, and bad judgment of members of the Association of their just dues. Cultists, anti-vivisectionists, anti-vaccinationists, quacks, and offended vendors of fraudulent nostrums, and the friends of all of them, while serving on juries, might well utilize their opportunities for augmenting awards of damages, knowing that any award made would come out of the funds of the American Medical Association.

"In the defense of its members, the American Medical Association would be handicapped by the fact that it would have to draw its expert witnesses from its own membership, since the weight of their testimony might be weakened by the fact of their association with the defendant in the same organization. The fact that the Associaion would indemnify the defendant against any loss through any award of damages against him would tend to create liberality on the part of the jury in awarding damages.

"If the American Medical Association were engaged in the defense of its individual members against losses through claims for malpractices it would have to call on its own members for expert testimony on behalf of the defendant. Under such circumstances the plaintiff would exert every effort, and frequently with success, to get before the jury that the witness testifying for the defendant was a fellow member with the defendant in the American Medical Association, that any judgment that might be awarded would be paid by that Association, and that, therefore, the witness had an interest in weighing his evidence in order to protect his own organization against financial loss. That would certainly tend to weaken the evidence of the witnesses for the defense.

"It is a commonly recognized fact that jurors are more liberal in awarding damages that are to be paid by supposedly rich corporations than they are in awarding damages when they know they are to be paid by some poor defendant. A jury that might award a moderate amount against some poor physician who the jury believed would himself have to pay any judgment awarded against him, would be ready to award a very considerable larger amount if it were known that any judgment awarded against the poor defendant would not embarrass him, since it would be paid by the American Medical Association."

SIXTH ANNUAL MEDICO-MILITARY SYMPOSIUM OF THE MAYO CLINIC

The 1934 Medico-Military Symposium for Medical Department Reserve Officers of the Army and Navy will be held at the Mayo Clinic, from October 7th to 20th, both dates inclusive.

This is the Sixth Annual Inactive Duty Training Course to be held at the Mayo Clinic and will follow the plan which has been proven so satisfactory in past years; that is to say, the morning hours will be devoted to attending clinics on subjects selected by the student officers, and the afternoon and evening hours given over to work in Medico-Military subjects. The Medico-Military program will be under the personal supervision of Colonel Kent Nelson, M.C., U.S. Army, Corps Area Surgeon, Seventh Corps Area, and Captain J. B. Mears, M.C., U.S. Navy, District Medical Officer, Ninth Naval District.

The staff and faculty of the Mayo Clinic have placed their unexcelled facilities at the service of their government in the interest of prepardness and have extended an invitation to all the service to participate. The two weeks' excellent clinical post-graduate work must make a definite appeal to all who are interested in their profession and does not incur as great a loss of time for the private practitioner that normally pertains to post-graduate work along professional lines.

The general motif of the Medico-Military part of the symposium will be "Public Health and Its Relation to National Defense." The problems of administration in military service presents features not dealt with in private practice. In the great field of sanitation as applied to military service, the medical officer has a distinct specialty. This course offers valuable and interesting training for the medical officer in all the components of our national defense. A splendid program of a thoroughly practical nature has been carefully compiled and the speakers selected for their ability to present authoritatively the subject assigned them.

Application for this course of Inactive Duty Training should be made either to the Corps Area Surgeon, Seventh Corps Area, Omaha, Nebraska, or to the District Medical Officer, Ninth Naval District, Great Lakes, Illinois. Applications should state the character of the work the candidate desires to follow in the morning hours. All student officers are expected to attend and participate in the afternoon and evening sessions. Each applicant should fully understand that the invitation to accept this course of study without charge is extended by the Mayo Clinic; that the project is without expense to the Government; and that one hundred hours' credit will be given those who take and complete the course. While it is desirable to attend the entire course, those whose time will not permit this may join or leave at any time and will receive credit for the hours spent in training. Uniforms are optional.

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Editorial Notes—Personal and General

DR. and MRS. R. Q. ATCHLEY, Tulsa, spent the latter part of August at Three Lakes, Wisconsin.

DR. J. E. STANDIFER, Elk City, has returned from New Mexico and Colorado where he has been vacationing.

DR. EARL McBRIDE, Oklahoma City, spent the latter part of August at Cottonwood Lake, Colorado, with his family.

DR. E. W. REYNOLDS, Bristow, has been named as county physician, Creek County, succeeding Dr. O. C. Coppedge.

DR. LeROY GOODMAN, formerly of Yukon, has opened offices in Shawnee where he will be on the surgical staff of the Shawnee Hospital.

DR. G. W. DIGGS, Wetumka, was elected county commander of the American Legion. Dr. Diggs was formerly post commander of the Clarence Kitchen Post.

DR. and MRS. G. A. KILPATRICK and family, Henryetta, spent two weeks in August in Rochester, where Dr. Kilpatrick took special work at the Mayo Clinic.

DRS. E. S. FERGUSON, E. GORDON FERGUSON and JOHN FERGUSON, Oklahoma City, are spending the remainder of the summer in Winnepeg, Canada.

DR. AND MRS. ONIS HAZEL, DR. AND MRS. JOHN H. LAMB, Jr., and DR. E. S. LAIN, Oklahoma City, have returned from a two weeks' fishing trip on the Minnesota lakes.

DR. and MRS. W. W. KERLEY, Anadarko, have returned from Chicago, where they attended the World's Fair, and Montreal and Quebec, Canada. On their return they visited New York, Boston and Washington, D. C.

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THE DALLAS SOUTHERN CLINICAL SOCIETY will hold its seventh annual clinical conference at the

Baker Hotel, Dallas, Texas, March 18 to 25, inclusive. Featured for the occasion are fourteen distinguished guest speakers, fifty-four graduate lecture hours, daily afternoon clinics and clinico-physiological conferences, operative clinics, round table luncheons, night symposia, and clinical banquet. Five full days of unexcelled post-graduate teaching by outstanding lecturers. Detailed information may be had by writing Dallas Southern Clinical Society, 1414 Medical Arts Building, Dallas.

MRS. MARIE HAVEN FERGUSON

The profession of the state was greatly shocked to hear of the untimely death of Mrs. E. S. Ferguson, wife of one of our recent past presidents. The doctors of Oklahoma and their wives will remember this gracious lady who has been hostess on many occasions during our meetings in Oklahoma City.

Mrs. Ferguson became ill at her home, 700 Northwest Fifteenth Street, and after about ten days was taken to St. Anthony's Hospital where she expired August 5th. She was very active in social life in Oklahoma City and particularly in the activities of the First Presbyterian church. She was a very fine vocalist and gave freely of her talent for the entertainment of her many friends.

Mrs. Ferguson is survived by our colleagues, Drs. E. S. Ferguson, E. Gordon Ferguson and John Ferguson, who is a junior at Yale.

At this time we wish to express to these survivors the sincere sympathy of the profession of Oklahoma.

INTERNATIONAL ASSEMBLY INTER-STATE POST GRADUATE MEDICAL ASSOCIATION OF NORTH AMERICA

The first International Assembly of the Inter-State Post Graduate Medical Association of North America to be held east of the Alleghenies is to take place in the public auditorium of Philadelphia, Pennsylvania, November 5th, 6th, 7th, 8th and 9th, 1934, with pre-assembly clinics on November 3rd and post-assembly clinics on November 10th in the Philadelphia hospitals.

The public auditorium is located in the university area and across the street from the Philadelphia General Hospital, thus assuring the assembly close access to an abundance of clinical material.

The aim of the program committee with Dr. George W. Crile as chairman is to provide for the medical profession of North America an intensive post graduate course covering the various branches of medical science. The program has been carefully arranged to meet the demands of the general practitioner, as well as the specialist. Extreme care has been given in the selection of the contributors and the subjects of their contributions.

The Philedelphia County Medical Society will be host to the assembly and has arranged an excellent list of committees that will function throughout the assembly. A most hearty invitation is extended to all members of the profession who are in good standing in their state or provincial societies to be present and enjoy the hospitality of Philadelphia, "The City of Brotherly Love". A list of distinguished teachers and clinicians who are taking part on the program will be found on page 21 of the advertising section of this Journal.

All members of Oklahoma State Medical Association are cordially invited to attend. Registration fee of $5.00 admits all members of the profession in good standing.

Special reduced railroad rates will be in effect on all lines.

SUPRAPUBIC PROSTATECTOMY WITH IMMEDIATE CLOSURE OF THE BLADDER: IMPROVED METHOD OF POSTOPERATIVE DRAINAGE

H. H. Haynes, Clarksburg, W. Va. (Journal A. M. A., July 21, 1934), presented eight cases of primary closure, with postoperative drainage by a return flow catheter. The usual suprapubic incision is made. When the bladder is opened, suction is used to remove the contents of the distended bladder and thereby avoid unnecessary soiling of the wound. After enucleation of the prostate, complete hemostasis is obtained and the prostatic fossa is obliterated with plain catgut. An ordinary catheter used for irrigating and distending the bladder is left in the urethra during the operation. Before the fossa is obliterated, the end of the small intake tube of the special drainage catheter is sutured with strong silk or linen to the tip of the catheter introduced before operation. The urethral catheter is now withdrawn and the special catheter follows through the urethra. When the distal end of the drainage catheter is withdrawn, the intake tube is removed from the main catheter through the small oval opening. The button flap is adjusted over the intake tube and fastened in position to prevent leakage of the return flow. The intake tube is then attached to the irrigating apparatus and the return flow tube connected to carry the return flow into a suitable receptacle. The irrigation is now turned on to demonstrate that the drainage catheter is functioning properly. After obliteration of the prostatic fossa and complete hemostasis, the Pezzer tip of the drainage catheter is drawn snugly into position. The usual suture to obliterate the space of Retzius is now placed but not tied. After this the bladder incision is closed completely with two rows of chromic catgut. The first row of sutures should include all the muscularis but not the mucosa and is a continuous lock suture. This row is completely buried by a continuous Cushing right angle suture. The suture, previously placed to obliterate the space of Retzius, is then tied. The abdominal wound is closed in the usual manner except that several loops of catgut extending down to the bladder are placed in the lower angle of the incision for drainage of the prevesical space; these are removed on the third day. Continuous irrigation, by the drop method, is started before the bladder is completely closed and continued twenty-four hours. On the second day irrigation is done every four hours, and afterward every morning and evening. The drainage catheters were removed from the seventh to the tenth days. Vasectomy was not performed in any of these cases and epidimymitis or other complications did not occur. There was no bladder leakage in any of these cases and all suprapubic wounds were completely healed when the patients were discharged from the hospital. The advantages of this method of drainage are continuous or intermittent return flow irrigation with any desired solution, better drainage, shorter hospitalization, no suture anchorage in the bladder, assistance from Pezzer tip in obliterating prostatic fossa and better anatomic and functional results.

ABSTRACTS .. REVIEWS .. COMMENTS AND CORRESPONDENCE

EYE, EAR, NOSE and THROAT

Edited by Marvin D. Henley, M.D.
911 Medical Arts Bldg., Tulsa

Muscle Training in Functional Convergence Insufficiencies. Leighton F. Appleman, M.D., Philadelphia. Archives of Ophthalmology, June, 1934.

A stimulating discussion is given of this subject with helpful suggestions for keeping the interest of the patient over a period of trying weeks or months, both for the oculist and the patient. The progress of the patient is slow many times and it is a difficult matter to keep him from becoming discouraged and forsaking his exercises. The author's explanation to the patient of the necessity of the routine inaugurated in muscle training is of interest to all oculists. It gives the patient a different perspective as to why he must daily perform the outlined manipulations.

The oculist himself must be firmly convinced that the outline of treatment to the patient will produce the desired result before he will be able to successfully pass this conviction on to the patient. So many different methods are used to attain similar ends that there is more or less confusion in regard to this subject. The fact is deplored that the knowledge obtained from post-graduate work is not used more in our routine clinical work. Asthenopic symptoms are referable to the refractive error, muscle imbalance and deficiency in convergence power. The essayist concerns himself with the last mentioned in this publication.

The exercises when properly carried out for the proper length of time rarely have to be repeated even over a period of many years. If the prism is increased too rapidly or the treatments stopped too soon, repetition will be obligatory if the patient is to become free of symptoms. When the patient arrives at the point in his exercises where he can see for himself that there is improvement it is not so great a task for the oculist.

Two cases are reported. One, a nurse, age 40, a hyperope, who had worn glasses for fifteen years. At the first testing there was present an imbalanced convergence power. Muscle training was started but after two or three weeks she gave up the exercises saying that they provoked rather than helped her symptoms. About three or four years later she returned because of increased symptoms. Muscle training was again started but this time with a much weaker prism and after four and a half months' training she has remained free of symptoms for the past ten years. Probably if she had been started with the weaker prism the first time she would have been able to continue the exercises and would have been saved years of discomfort. The second case is that of a teacher, age 33, a myope, who after six months of exercises was relieved of all symptoms for eleven years. A second course of exercises of four months duration gave her the required converging power to carry on her prolonged close work without discomfort.

The tedium of the exercises is amply repaid in the comfort to the patient and satisfaction of the oculist.

Latent Osteomyelitis of the Sphenoid Bone Reactivated by Trauma With Death From Meningitis. Dr. Aaron Kaufman and Dr. Samuel J. Hartmere, Boston. The Laryngoscope, June, 1934.

"Sphenoidal suppuration is not rare; it is only its diagnosis which is uncommon," is the observation of Lermoyez. Postnasal catarrh, headaches and ocular disturbances whose etiology remains unknown over a period of time should make one think of an osteomyelitis unless this condition has been definitely ruled out. When the diagnosis is made one should not hesitate to take the necessary steps for the eradication of the infection, varying from nasal cleansing treatments to surgical removal of the focus of infection. The anatomy of the sphenoid bone is given in much detail and reasons in this connection pointed out as to why a patient with this condition is especially prone to contract meningitis by extension of the infective process. The roof of the bone and along the course of the vessels through the bone are particularly vulnerable points. A careful roentgenogram study of each patient is stressed. There is a case report of a female, white, age 18, who gave a history of a chronic maxillary sinusitis and ethmoiditis which had been treated for some time. She came under observation in July, 1926. Her chief complaint was difficulty in breathing and a thick nasal discharge. Tissues of the nose were swollen and boggy at this time but no diagnosis was made. She again appeared in October, 1930, complaining of headaches and nasal discharge. These frontal headaches were of four years duration and of the greatest intensity in the mornings. They radiated toward the occiput. The tonsils and adenoids had been previously removed. Inspection showed tonsilar tabs present in both fossa and a green postnasal discharge. In the middle and inferior meati, left, there was a partial obstruction with a discharge similar to that in the postnasal region. When the left side was cleansed with suction polyps and polypoid degeneration were found. There was tenderness in. the left supraorbital region. The right side was negative. Translumination was positive over the entire left side of the face. Roentgenograms showed a left frontal sinus and ethmoids and both antra with thickened mucous membranes.

The diagnosis at this time was a left pansinusitis. A left radical maxillary sinus and partial transantral ethmoidectomy was done November 21, 1930. Eight days postoperative there occurred a profuse hemorrhage from the left nares which was checked with difficulty by means of packs nad sponges. The following day there was a rise of temperature with the beginning signs of meningitis. The fundus examination revealed no abnormality. The white count was 23,000. On December 5, a lumbar puncture confirmed the suspicion of meningitis. The patient appeared quite comfortable immediately following the lumbar puncture but one hour later quietly died.

Post mortem examination showed the pons and the inferior surface of the cerebellum covered with a thick exudate with a small pressure cone present,

a condition which according to the consulting neurologist is not uncommon in patients who have not died suddenly. The ethmoids on both sides and the sphenoid were full of thick pus. The dorsum sellae showed chronic osteomyelitis which was continuous into the sphenoidal sinus.

A more careful observation and roentgenogram study would help to avoid such grave results.

Notes on the Diagnosis of Otitic Meningitis. Samuel J. Kopetzky, M.D., New York. Annals of Otology, Rhinology and Laryngology, June, 1934.

Because of the many hazards surrounding otitic meningitis it is apparent that an early diagnosis in meningeal infection, of this origin, is of the utmost importance. It is generally agreed that the cerebrospinal fluid is a dialysate. The author gives Weed's theory of the filtration of the fluid. Normally the cerebrospinal fluid is concerned with the metabolism of the brain cells and equalizing and maintaining the intracranial pressure, but when a meningeal infection occurs these normal functions are upset, resulting in unusual conditions, which are found in a study of the fluid.

A great amount of fluid from capillary blood vessels is the first effect of a meningeal infection. It is thought by some that this is a manifestation of the body's defense against the oncoming infection. An increase of lactic acid in the cerebrospinal fluid is noted in the very early stages of meningitis. This condition is also true of the blood plasma, especially during fever, although the lactic acid content of the former is four times that of the latter. The result of this increase lessens the alkaline reserve and drives off carbon dioxide from the carbonates. In meningitis then there is a greatly lowered ph. and a decreased bicarbonate content. The second stage of meningitis involves the changes in the brain tissue, the cells of the chorid plexus, the perineural and perivascular spaces. An abnormal amount of cholin is found in the fluid caused by the impediment of the cell functions. Fisher's theory that "the cause of edema is to be found in the accumulation of acid products in the tissues," is still questioned, but in regard to this particiular stage being discussed, it is apparently verified.

If life is to be saved, the diagnosis must be made early before the lesion has had time to progress and before the cell destruction has reached the vital centers. Because the hazards surrounding otitic meningitis are many it is apparent that early diagnosis in a meningitis of this origin is of the greatest significance if a favorable prognosis is to be given.

The gravity of the lesion is not shown by the findings of a physical examination, no matter how carefully done. It can only be fully revealed by an examination of the cerebrospinal fluid. The prognosis is best in those cases which have no impediment to the ready escape of the fluid at the time of the spinal puncture. A fluid which escapes sluggishly probably is hindered by exudates, mechanical obstruction between the ventricles or a concentration of the fluid due to the increased cell content. This original monograph is accompanied by charts which illustrate the various points made in the discussion.

Temperature After Mastoidectomy. Henry P. Johnson, M.D., Portland, Me. Archives of Otolaryngology, June, 1934.

One hundred cases of consecutive mastoidectomies are examined "for the immediate effect on the temperature produced by the operation, the variations of the temperature curve after operation in the uncomplicated cases, the duration of the postoperative fever in the uncomplicated cases and the day on which it was the highest, the postoperative day of the onset and termination of an unusual fever, the variations of the temperature curve in the complicated cases and the effects produced in the temperature as a result of the treatment instituted in the complicated cases."

The temperature curve during the first twenty-four hours following operation showed a drop in sixty-nine cases. The postoperative temperature curve in uncomplicated cases showed sixty patients with an uneventful recovery; it also showed in fifty-three cases that the average time for the running of temperature was five days. Harris believes that postoperative rise in temperature of a moderate amount is customary in mastoiditis and that without other symptoms fever is without significance and should not be a source of anxiety. The temperature curve following operation in cases of preoperative complications is of interest only in that it is an indication of the progress of the patient. The postoperative temperature is of much more importance clinically than the preoperative rise. It is a very definite sign showing onset of postoperative complications which calls upon the surgeon's skill in differential diagnosis to determine the cause of the temperature. Every possible source of infection should be carefully considered and grave consideration given before the patient is subjected to the additional perils of a second operation.

Complications occurred in thirty-six cases. The most common complication was otitis media and mastoiditis of the opposite side. Nineteen cases in the series of one hundred were so affected. This is one of the first things which must be ruled out when we have an unexplained rise in temperature soon after operation. If the mastoid wound becomes infected, i. e., stitch abscess, cellulitis or erysipelas, it usually occurs in the first three or four days. Erysipelas may cause much concern before the rash appears. In a sinus thrombosis, which occurs later, the patient appears well, while in erysipelas the patient is prostrated. The temperature in sinus thrombosis is intermittent while in erysipelas it is high or remittent. Dixon states that the etiological factor in erysipelas is operating too early in the course of the disease. Evidence from this series of cases refutes this statement.

Cervical adenitis is another confusing factor entering into postoperative temperatures. The patient may have no complaints which would lead the surgeon to suspect an adenitis as the cause of the sudden rise in temperature. Diagnosis is made by exclusion of other possibilities and daily inspection for enlarged and tender glands. Infections of the respiratory tract are usually confined to bronchitis, which is most prevalent, and tonsilitis. Infection of the lateral sinus occurs in about three to six per cent of the operative cases of mastoiditis according to Campbell. The literature of today fully describes the various phases of sinus thrombosis which usually appears at least seven or eight days or later postoperative. Involvement of the kidneys should not be overlooked as a possibility to account for the temperature.

An unusual instance of a pelvic abscess complicating a mastoidectomy, during which the lateral sinus was accidentally opened, is cited. Details are not overlooked in this report and when they were not available the fact is mentioned by the author.

SURGERY AND GYNECOLOGY

Abstracts, Reviews and Comments from LeRoy Long Clinic
714 Medical Arts Bldg., Oklahoma City

Hyperparathyroidism and Generalized Fibro-Cystic Ostitis (Hyperparathyroidie et Osteite Fibro-Kystique Generalisee). By A. Ravina and Simone Lyon, La Presse Medicale, June 23, 1934.

This article is a concise review of the relation of hyperparathyroidism to diseases of the bones in which there is a remarkable loss of calcium. The subject has been treated in a most enlightening way by American authors, but attention is called to it here because of the desirability of a clearer understanding of the etiology.

There are references to the theory of von Recklinhausen to the effect that cystic disease of the bones (von Recklinhausen's disease, first described in 1891) was due to nutritional disturbances; and to the theory of Erdheim that adenoma of the parathyroid was a secondary manifestation. This is quickly followed by a reference to the report of Mandl in 1926 where there was striking improvement in the case of a patient suffering of von Recklinhausen's disease after the expiration of a parathyroid tumor; and associated with the improvement there was striking decrease of blood calcium and of calcium in the urine.

The authors remind the reader that the normal blood calcium varies from 12 to 20 milligrams to 100 cc., but that in cystic disease of the bones it may reach 23.6 milligrams; that at the same time there is a drop in blood phosphorus and a tremendous increase of calcium in the urine—sometimes six to eight times the normal amount.

Comment: I believe that it may be said that hyperparathyroidism alone, without neoplasm, occupies a very doubtful position in relation to hypercalcemia and loss of bone calcium. To put it another way, it appears to be pretty clear that the surgical removal of the parathyroids will be of no service in von Recklinhausen's and kindred disease unless they contain adenomata.

—LeRoy Long.

Compression of Trachea by an Adenomatous Goiter Situated in the Thoracic Inlet. By W. A. Plummer, Proceedings of the Staff Meetings of The Mayo Clinic, July 11, 1934.

In cases of goiter situated in the thoracic inlet, error occurs frequently in estimating the size of the goiter and the extent of the mechanical difficulties which it may produce. Unless a goiter so situated consists of a single adenoma that can be grasped as it moves upward during deglutition, it cannot usually be palpated in its entirety, and, if no substernal goiter is demonstrated roentgenologically, the size of the tumor may be underestimated. Furthermore, the thoracic inlet forms a bottle neck in which a relatively small goiter may produce subjective and objective evidences of tracheal compression. It must be remembered, however, that small goiters which are entirely cervical in situation may, under certain conditions, distort or compress the trachea. The tracheal insult may be in the form either of lateral displacement from a unilateral adenomatous goiter, or of constriction from the wedging effect of a bilateral goiter, or it may be an anteroposterior deformity from a retrotracheal goiter.

In this article Dr. Plummer emphasizes the occasional importance of two diagnostic procedures that he believes are not fully appreciated: First, the change in the inspiratory sound, and second, the change in outline of the trachea as demonstrated by roentgenologic examination. Slight changes in the inspiratory sound, produced by distortion or constriction of the trachea, usually are not recognized by the examining physician. Frequently the sound has not been apparent to the patient himself or to members of his family, even though it is so intense that it would be obvious to a stranger, because of the fact that it develops gradually. It may be referred to as a slight stridor. As the term "stridor" is ordinarily used, however, it conveys an impression of magnitude and of quality that certainly is not descriptive of the respiratory sound the writer referred to. Moderate distortion or constriction of the trachea produces only a slight exaggeration of the inspiratory sound, with a change in pulse that may be referred to as hollow: it defies description and must be heard repeatedly in varying intensities to be recognized readily.

In all cases of adenomatous goiter in which the growth is of any appreciable size, the examining physician should make a deliberate effort to elicit the characteristic sound by having the patient inspire quickly and deeply with the mouth open. Frequently this characteristic sound will be most noticeable when prolonged inspiration with the mouth open is involuntary, as at the end of a fit of laughter, a paroxysm of coughing, or at the end of a long sentence, even though inspiration is not forced and the mouth is only slightly open.

When examining roentgenograms of the thorax in cases of goiter, one should note not only the presence or absence of substernal enlargement, but also the form and position of the trachea. The trachea is usually well outlined in the routine roentgenogram of the thorax, but it may be entirely obscured in certain deep-chested individuals. In the occasional case it may be advisable to take both anteroposterior and lateral roentgenograms of the trachea, using a special technique which consists of a longer exposure and the use of the Potter-Bucky diaphragm.

—LeRoy Long, Jr.

Urinary Calculi Associated With Parathyroid Disease. By S. H. Colby, Journal Surgery, Gynecology and Obstetrics, August, 1934, P. 210.

The fundamental problem in the consideration of urinary tract calculi is the prevention of recurrence. The great clinics of this country report from twenty to forty per cent recurrence in nephrolithiasis after operation. The surgical removal of the calculi without any attempt to discover the reason for its growth must lead to recurrence in many instances. Thus we are led inevitably to a discussion of the causes of urinary lithiasis.

First, as regards the urine itself, we know that here is the extraordinary phenomenon of an extremely supersaturated solution which does not obey the ordinary laws of chemical solutions. In a 24-hour amount of urine there is a greater quantity of salts than could possibly remain in solution in an equal volume of water. The ability of the urine to hold salts in solution is said to be due to the presence in the urine of protective colloids. They prevent the precipitation of the salts and inhibit the formation of calculi. If the colloids are diminished in amount, or if their action is interfered with as by chemical changes such as occur in stagnant urine, the protective mechanism is lacking and the excess of free salts

is precipitated with a resulting formation of urinary calculi.

Stone formation in the urinary tract, therefore, is the result of an abnormal precipitation of the crystalline elements normally present in the urine. The causes of the abnormal precipitation are probably multiple.

There is considerable evidence that obstruction plays an important part in stone formation. The importance of infection as a cause of stone formation is difficult to evaluate. Diets deficient in vitamin A, prolonged for some time, cause crystalline deposits in the urinary tract of laboratory animals. Such dietary deficiency experiments go far to explain the geographical incidence of stone, such as its prevalence in certain parts of India and China.

It has been proved that the parathyroid glands effect calcium matabolism. Total extirpation of these glands causes a fall in the serum calcium and results in tetany. Within recent years it has been shown that tumors of the parathyroid cause marked metabolic changes with a loss of bone calcium, elevation of the serum calcium, and increase in the urinary output of calcium. The resulting bony changes, decalcification, cysts, benign giant cell tumors, and spontaneous fractures, characterize the condition known as generalized osteitis fibrosa. Crystalline deposits occur in the urinary tract with such frequency in this disease that the association of the two is more than coincidence.

The pouring out of calcium from the body through the urinary tract seems to result in stone formation in many patients with hyperparathyroidism. Very likely the marked increase in urinary crystalloid in this condition places such a burden on the protective colloid mechanism of the urine that stones are apt to form. How important a place urinary stasis assumes in this evident tendency to stone formation in parathyroid disease is not yet determined, but there is evidence that obstruction is a considerable factor.

Serum calcium and serum phosphorus estimations have been performed routinely at the Massachusetts General Hospital for some time in these cases of nephrolithiasis. As the association between urinary tract stones and parathyroid disease is more generally appreciated, many more instances of a similar nature are certain to be recognized.

Tumors of the parathyroid cause metabolic disturbances which result in a marked increase in the urinary output of calcium, a decrease in the output of phosphorus, and lead to the formation of stones in the urinary tract in many instances. While generalized osteitis fibrosa is frequently accompanied by urolithiasis, it is important to recognize the fact that stone formation occurs often in the urinary tract without any of the bone changes which characterize this disease, although tumors of the parathyroid are present and are the underlying cause of the stone formation. Unless the parathyroid tumor is removed stones will frequently occur.

—LeRoy Long, Jr.

Relief of Intractable Pain, by the Intraspinal (Subarachnoid) Injection of Alcohol. By Elias Lincoln Stern, M.D., New York City. The American Journal of Surgery, August, 1934, P. 217.

Dr. Stern presents a method for the relief of excruciating pain of a chronic nature. He reports fifty cases where intraspinal subarachnoid injections of 95 per cent alcohol were employed with relief of pain and no ill effects.

He points out objections to paravertebral nerve blocking in the relief of severe chronic pain as follows:

1. Usually the somatic nerves affected are numerous. Therefore to block all the afferent pathways involved, one would have to block motor nerves as well.

2. Very often fibers of the sympathetic nervous system are involved in addition to the cerebro-spinal nerves. It is difficult to effectually block sympathetic fibers paravertebrally.

3. Paravertebral blocking is usually accompanied by some pain and shock and is time-consuming.

"The method of relieving intractable pain by injecting small quantities of alcohol intraspinally into the subarachnoid space is a safe, quick, painless, nonshocking procedure. While no serious complications have resulted in my experiences, if the procedure is not done properly, serious, if not fatal results may occur, as demonstrated experimentally in lower animals."

The author then outlines in considerable detail the important anatomical features of the spinal roots, the intraspinal membranes and the cerebro-spinal fluid as a fundamental basis for the technic of the procedure.

The principle of the method depends upon the fact that the specific gravity of alcohol is enough lower than that of the spinal fluid to allow it to rise to the top and the injection is made slowly using from 4 to 16 minims of sterile 95 per cent alcohol with the patient's spine flexed laterally and partially rotated so that the alcohol surrounds principally the posterior nerve roots.

He then describes in minute detail the technic for the spinal injection of alcohol.

In most cases the relief of pain was quite remarkable, usually noticed immediately, but occasionally not until one to seven days after the injection. The usual length of time in which there was complete relief was from one to eight months, with an average duration of about three months. He reports in his fifty cases, 70 per cent with complete relief, 30 per cent with partial relief and 10 per cent with no relief.

"In no case has there been any loss of muscle, tendon, or joint sense; no loss of synergic control of muscles; no loss of equilibrium; no loss of automatic control of muscle; and no trophic ulcerations of any kind.

"In no case has there been any motor paralysis, although transitory motor weakness may be complained of when the larger doses of alcohol are used. A transitory sensory paralysis of the bladder and rectum may occur with injections between the second and third lumbar spines. This can now be avoided by limiting the dose at this level to 8m."

The abstracts of nineteen cases of cancer given as follows:

"Carcinoma of stomach	2
Carcinoma of cervix	5
Carcinoma of prostate	4
Carcinoma of rectum	4
Sarcoma of pelvic bones	2
Bronchiogenic carcinoma of lung	1
Sarcoma of tibia with x-ray ulceration	1"

The author writes the following conclusion with the observatioin that the effect of the alcohol upon the sympathetic fibers suggests a possible treatment

in diseases and disorders of the sympathetic nervous system:

"The procedure when successful is invaluable in the relief of chronic, painful conditions. A single, subarachnoid alcohol injection may give relief for as long as eight months. It obviates the necessity for using narcotics in large doses, and diminishes the possibility of making drug fiends of chronic invalids. By relieving pain, it allows more intensive x-ray, radium, or other medical treatment to be given, and so tends to prolong life."

—Wendell Long.

Intraspinal (Subarachnoid) Injection of Absolute Alcohol, for the Control of Pain in Far Advanced Malignant Growths. By Harry C. Saltzstein, M.D., Detroit, Mich. Journal American Medical Association, July 28, 1934, P. 242.

This author very briefly compares the advantages of subarachnoid injections of absolute alcohol for the control of pain in far advanced malignant growths over cordotomy and division of the superior mesenteric plexus.

He reports eleven cases and of these one was not relieved but the others were greatly benefited by the procedure.

He gives abstracts of illustrative cases and reports a small number because he feels it is a very valuable procedure and that it should be used more extensively, especially in terminal cases where there is a life expectancy of weeks only.

Comment: In far advanced, incurable malignant disease, excruciating pain is frequently a very distressing situation to patient, family and doctor. These reports of alcohol injection into the subarachnoid space with relief of pain and no untoward effects suggest a simple method for this very disturbing condition. It is perfectly obvious that one should thoroughly familiarize himself with the principles and the technic of the procedure before it is employed. It is also obvious that certain ill effects may be expected if this method is employed upon a large scale.

—Wendell Long.

Obstructions of the Choledochus by Enlarged Glands (Les Obstructions du Choledogue par Adenopathies). By Marcel Brule and Jean David, La Presse Medicale, June 30, 1934.

Remarking that it is well understood that there may be pressure upon the common duct (choledochus) by enlarged glands associated with malignancy and tuberculosis, and in which operative procedure would be useless, the authors discuss obstructions of the common bile duct due to pressure by adenopathies due to benign and non-tuberculous inflammatory processes.

Several case reports are presented, and they are illustrative of the hypothesis and arguments of the authors.

A robust boy of fifteen years was seen in the eleventh week of a profound jaundice. At that time there was neither pain nor fever. There had been a little fever just before the appearance of the jaundice. The various analytic procedures, including x-ray examination, were negative. The border of the liver was smooth, slightly tender to palpation, and extended below the rib margin to the extent of the breadth of three fingers.

Believing that the smooth and enlarged liver, without fever, was more indicative of an obstruction of the common duct in some way not associated with prolonged infection, a surgical exploration was advised. At operation an enlarged lymph gland, the size of a cherry stone, at the junction of the cystic with the hepatic duct, was pressing firmly upon the latter. The gland was extirpated, after which it was possible to recover bile by puncture with a hypodermic needle below the point of obstruction. The jaundice disappeared, and recovery seemed to be complete. The pathological examination of the extirpated gland revealed only a hyperplastic reaction, without any evidences of malignancy.

Another case reported is that of a woman thirty-six years of age. In August, 1924, after confinement, there were epigastric pains, fever and jaundice. The jaundice was not very pronounced, but persistent. She was seen in December by Professor Lecene. There was at that time some jaundice, with irregular fever. At operation the gall bladder and pancreas appeared to be sound, but there were several enlarged glands about the bile ducts. In this case recovery followed a cholecystostomy. One of the glands removed at the time of operation had the histological structure of chronic inflammation.

A young man of twenty-one had had nausea and vomiting and pain in the stomach for about two months. He had lost over twenty pounds. An operation was done for the purpose of relieving what was supposed to be an ulcer of the duodenum. It was found that stomach, duodenum, gall bladder and all appeared to be normal, but at the place where the common duct passes behind the duodenum it was compressed by three enlarged glands, one of which was hard and calcified. These glands were removed and the patient recovered. The glands presented the histological structure of chronic inflammation.

Comment: One must not be misled by statements that are too dogmatic but, at the same time, this article calls attention to a possible explanation of persistent jaundice due to obstruction of the common duct by pressure from removable enlarged glands on the outside of it.

The second case reported is not exactly in point. Since recovery followed a cholecystostomy, it is a reasonable conclusion that there was chronic inflammation of the gall bladder, and that it was most likely associated with an involvement of the adjoining biliary tract, the enlarged glands being the result of the inflammation, and reducing in size after drainage of the gall bladder had cured the inflammation.

One must remember, too, that in operating it is not wise to tinker too much about the bile tract area. The extirpation of glands about the duct is usually not very difficult, but there is always a possibility of getting into embarrassing situations through the wounding of important structures, like the portal vein. To sum up, I am in entire accord with the general tenor of the authors' general statements, but call attention to the wisdom of having some definite plan of procedure which should be carried out with circumspection.

—LeRoy Long.

Trauma of the Thorax and Pulmonary Tuberculosis (Traumatisme du Thorax et Tuberculose Pulmonaire). By N. M. Stoichitza, Bucharest, La Presse Medicale, June 30, 1934.

The author takes the definite position that trauma

of the chest may be the exciting cause of the more or less rapid development of tuberculosis.

It is believed that tuberculosis following trauma is a pretty rare condition. The statistics quoted by the author vary a good deal. For example, he quotes certain writers to the effect that trauma is the exciting cause in about 1 3-10 per cent of the cases of tuberculosis, but this is followed by the opinion of Pilod who believes that the per cent is much lower, it being estimated as about 1-100 per cent.

It is not believed that the development of pulmonary tuberculosis is very often excited by penetrating wounds, most of the cases following severe contusion of the chest. This is the opinion of Professor Sergent who made some investigations dating from 1916, and the conclusions of Sergent are supported by the work of Ribadeau-Dumas, Devic, Cordier, L. Bernard and Mantoux.

In 1929 Pilod reported the case of an aviator who, following a severe contusion of the chest in an accident, had hemoptysis, and several months thereafter there was a frank pulmonary tuberculosis.

It is remarked that the beginning of pulmonary tuberculosis after an injury may be characterized by hemoptysis, pneumonia, or pleurisy, but it has been the common observation that there is practically always hemoptysis, regardless of the subsequent pathology.

It is the conclusion of the author, and those investigators quoted by him, that in practically all the cases there is a latent tuberculosis before the trauma, the trauma furnishing a field for the development of germs theretofore confined in a clinically healed area.

In the average case, the clinical signs of tuberculosis appear between three and six months after the trauma, and in the average case the evolution is rapid and grave. It is not believed that a tuberculosis which develops as long as a year after a trauma is often, if ever, associated with the trauma.

In support of the thesis of the author, the case of a laborer 57 years of age is reported. He was seen a few days after an accident when he was struck by a heavy piece of wood below the left clavicle. The blow was so heavy that he was knocked down, and there was immediate hemoptysis. He came for examination because of persistent pain, and he was anxious to know whether there had been fracture of the ribs. A physical examination disclosed only the signs of a chronic bronchitis with a certain degree of emphysema.

An x-ray examination was made. It did not show any evidence of fracture. Incidentally, there was a good negative of the lungs which presented the x-ray findings common at his age—that is, a little thickening about the hilus with some calcified nodules and the accentuation of the general net work. Notwithstanding these findings, there was continuation of thoracic pain and progressive loss of weight and strength. Six or eight months later there was both physical and x-ray evidence of progressive tuberculosis involving the left lung. Numerous bacilli were found in the sputum. He was sent to a sanitorium where it was advised that an artificial pneumothorax be employed. The patient refused. The condition became progressively worse, and in about seventeen months after the injury there was death following a frightful hemoptysis.

Another case is reported of a house man (garcon de Salle), 44 years of age. There was a history of a penetrating wound, by a knife, immediately below the left clavicle ten months before. The records showed that the wound had healed, and that an examination at that time, including an x-ray examination of the chest, did not show any evidence of pulmonary disease. According to the history there was an hemoptysis that lasted for four days after the injury, and the patient never did feel well afterwards. He began to cough in about six months after the injury, lost the appetite, and rapidly reduced in weight and strength. He had been seen by another physician about that time, and a diagnosis of pulmonary tuberculosis, left lung, was made. The physical and x-ray findings were characteristic, and the sputum contained many bacilli. At the time of this report, there was slight improvement in the condition of the patient.

In his argument, the author emphasizes the fact that both these patients were perfectly well before the injuries.

Comments: Professor Gosselin has explained the mechanism through which there may be rupture of the lung without fracture of the skeletal structures. Through an involuntary effort the glottis is closed at the time there is a blow upon the chest, thus increasing the pressure on the inside of the lungs. In the case of a person under thirty or thirty-five years of age, the ribs are elastic, so that there might be great damage of the lungs without fracture of the ribs. However, as pointed out by Gosselin, it is not common for a severe injury of the lungs to take place as a result of a severe contusion, without fracture of the ribs, in older persons.

The first case reported by the author seems to be quite convincing, except for the fact that the patient was 57 years of age. The assumption that there might have been an injury of the lungs sufficient to produce a severe hemoptysis, without fracture of the ribs, is hardly reasonable, for the reason that the ribs have relatively little elasticity at 57 years of age.

At the same time, I consider this an important contribution, because it is well known that the bacilli of tuberculosis may remain dormant in scar tissue for many years, and that they may become active if the scar tissue is damaged. I have observed this on several occasions in connection with the manipulation of a healed tuberculosis of the hip or knee, such manipulation being frequently followed by a reactivation of the tubercle bacilli.

—LeRoy Long.

INTERNAL MEDICINE

Edited by L. J. Moorman, M.D., 1200 N. Walker, Oklahoma City; C. E. Bradley, M.D., Medical Arts Building, Tulsa; Hugh Jeter, M.D., 1200 N Walker, Oklahoma City

L. J. MOORMAN

The Incidence of Tuberculosis Infection Among Children in New York City. Godias J. Drolet. The American Review of Tuberculosis, July, 1934.

In reviewing the data compiled from clinical examinations of nearly fifteen thousand children, made over a period of three years, the author is able to conclude that the incidence of tuberculosis in children in large cities is markedly decreased when compared to incidence a generation ago. A further bit of optimism is his demonstration that beside this lessened incidence of infection, there is a tremendous lessened incidence of mortality.

These statistics are considered from every possible angle, and the frequency of infection of the varying age groups, sex groups, racial groups, and groups of

children with known and unknown exposures, is reported in great detail.

It is shown that in New York, as in Chicago and Detroit, that in the entire mass of children examined by tuberculin and roentgenological tests, only 13.7 per cent were found to have positive infections. Of these, 4.3 per cent of the babies under one; 9.3 per cent of all those under five years; 19.1 per cent of those from five to ten; and 29.2 per cent of those from ten to fifteen years, were infected.

No appreciable difference between the sexes could be distinguished, but racial differences were pronounced. The negro children not only showed an incidence of infection more than double that of the white, but their mortality rate trebled and quadrupled the death rate of the white children. It was shown that there could be little real difference in the exposures of the two races, and hence this widely varying finding must be accounted for by some inherent difference in the races.

History of contact made a decided difference in the number of positives found when testing a group. This variation was most marked in the younger children, when, of course, intimacy of home contact is greater and going about more limited. Seasonal influence made little difference in determining the incidence of tuberculosis, but the mortality is much higher in the late winter.

In considering the mortality, it was found that an annual average of 354 deaths from tuberculosis among all children under fifteen occurred in New York City during the three year period of 1930-1932, a mortality rate of 21 per 100,000. One-third of the deaths was of colored children, though that group is but one-twentieth of the total child population. The death rate of the colored children was ten times that of the white children. Among young children, the male mortality exceeds the female, and even with infection less frequent in early childhood than later, the highest death rate occurs then.

The author attributes the rapidly declining incidence of tuberculous infections among children to the increasingly effective control of home sources of tuberculosis, especially in the city, where more than twelve thousand patients are rushed annually to tubeculosis hospitals and sanatoria, whether they are bed cases or not. He concludes that instead of a universal infection of all persons who have attained twenty years of age, there are now more than two-thirds of young adults wholly free from the disease.

The Lymphatic Reaction in Tuberculosis. Bruce K. Wiseman and Charles A. Doan. American Review of Tuberculosis, July, 1934.

In this study an analysis of the qualitative changes occurring in the lymphocyte, which the authors believe to directly reflect the functional state of the lymphopoetic centers, has been applied to disease. Tuberculosis has been chosen to furnish as the intial experimental and clinical test of this hypothesis.

In the experimental studies, it has been possible to follow the entire natural history of this disease, and it was found that a varying efficiency in the response of the lymphatic tissues from time to time was reflected by changes in the circulating lymphocytes, which in turn seemed to represent a very fair measure of the adequacy of the general immunological reactions of the animal.

A judicious interpretation of both qualitative and quantitative data is attempted in order to bring about the fullest understanding. A parallel series of clinical patients were observed at the same time the animal experimentations were being carried out, and the data assembled from the two groups are carefully compared and an attempt at correlation is made.

In all these studies, the lymphatic response has been far more sensitive, and has preceded other evidence of a changed status in the disease than any other criterion thus far used. It may thus be of distinct prognostic significance. Additional evidence is furnished in these studies of the direct part played by the lymphocyte in the cellular defense of the body against tuberculosis.

It is pointed out by the authors that emphasis is to be placed upon repeated examinations in the same patient, with exquisite technical precision rather than a single casual observation, if the full significance of the procedure is to be recognized.

The Role of Atelectasis in Pulmonary Tuberculosis. Barnet P. Stivelman. American Review of Tuberculosis, July, 1934.

The author demonstrates that contributory causes to the essential etiological factor in the production of actelectasis, namely, the complete obstruction of the respectively draining bronchus, are:

1. Inflammatory processes in the larger or smaller bronchi, causing accumulation of viscid secretion, which interferes with normal function of the ciliated epithelium.

2. Pain in the chest, or lower abdomen, which causes shallow respiration.

3. Administration of narcotics to ease pain which abolishes the cough reflex, and so militates against adequate pulmonary ventilation and drainage.

4. The prone position, which interferes with normal respiratory function.

He further demonstrates that actelectasis in tuberculosis is much more frequent than the literature would suggest, for in the case of tuberculosis there may be added to the above list the very common occurrence of pneumothorax, either spontaneous or artificial.

The author then discusses atelectasis under the headings of Acute Massive Atelectasis, which is rare except in profuse pulmonary hemmorhage; Chronic Massive Atelectasis, which is common in chronic inactive or benign tuberculosis of young persons, and is frequently associated with bronchiectasis; and Lobular Actelectasis, which the author states to be the most prevalent and the least appreciated form. Of the last type, he says, the most favorable areas are the lower aspects of the upper lobes, anteriorly, and particularly on the right side. It is also frequently encountered in the retrocardiac area, though it may occur at any place. In the latter position it is frequently mistaken for a nonspecific infection of the lower lobe, and in the former for an exudate at the upper right interlobular area, or a pneumonic consolidation of tuberculous origin.

Chronic Massive Actelectasis in Phthisis is most often confused with extensive unilateral pleuropulmonary fibrosis. Patients so affected may run a benign course, but, when dyspnea develops as a result of extensive mediastinal deflection, they can be effectively treated with artificial pneumothorax. Confluent lobular atelectasis is said to occur very frequently and early in the course of the disease, and

to encourage local fibrosis by producing a local tissue respiratory deficiency.

The author entertains the theory that tubercle bacilli, being strictly anaerobic, are markedly attenuated when deprived of an adequate amount of oxygen. Lobular atelectasis by impairing the local circulation, materially diminishes the available oxygen supply in the area involved and so adversely affects the growth of the tubercle bacilli.

To the fact that all forms of atelectasis are seen in lungs treated with artificial pneumothorax is attributed the rapid fibrosis of lesions under collapse therapy.

C. E. BRADLEY

Nasal Sinus Disease in Children. L. W. Dean, M.D., St. Louis, Mo. Southern Medical Journal, Vol. 27, No. B., May, 1934, Pages 418-421.

Infections of the nasal sinuses in children are of great importance in pediatrics. In almost every instance in which infection of the tonsils plays an important part in systemic disease, the condition of the nasal sinuses must be taken into consideration. Children with arthritis or heart disease who receive no benefit following a tonsillectomy, should be examined for infection in the nasal sinuses.

It is difficult to examine the nasal sinuses in children without an anesthetic. The x-ray is not a definite procedure although it tells whether or not the sinus is present or if it is of sufficient size to be of clinical importance. A blurred sinus on the x-ray plate, together with the presence of inflammation about the ostium of the sinus or in the pharnyx would suggest infection.

An important procedure in diagnosis is a bacteriological and a cytological study of the nasal discharge taken from the ostium of the sinus. The presence of eosinophils in this discharge suggests allergic rhinitis. A predominence of polymorphomuclear neutrophils indicates infection.

Many cases of asthma who have sinuses examined get relief only after the chronic sinuses are treated.

Chronic sinusitis is often associated with malnutrition, bronchiectases, Still's disease, pyelitis, nephritis, lung abscesses, diphtheria carriers, headaches, and frequent colds.

The first step in the treatment of nasal sinus infection is to remove the cause. Infected lymphoid tissue must be removed from the naso pharynx. Allergic conditions must be ruled out and corrected. Endocrine disturbances have to be considered. Hygienic, dietary and sunshine therapy should be carried out. Operative work on the sinuses in children is not often indicated unless a systemic condition indicates haste in the eradication of the infection. In children under ten years of age it is rare to consider the sphenoidal or the frontal sinuses. Not in more than one out of a hundred cases is it necessary surgically to attack the ethymoidal labyrinth and this should be done only when there is osteomyelitis present.

In 99 per cent of children with chronic nasal sinus infection and systemic complications, the surgical procedures in the nose are limited to the removal of obstructing lesions and to making a very small window in the nasal wall of the maxillary sinus for ventilation and drainage.

Sinus Thrombosis and Thrombophlebitis Complicating Mastoiditis: Case Reports. E. G. Gill, M.D., F.A.C.S., Roanoke, Va. Southern Medical Journal, Vol. 27, No. 8, August, 1934, Pages 718-728.

Sinus thrombosis is the most common of the intracranial complications of the inner ear and mastoid infections, and because it does not always follow the course outlined in text books is particularly interesting.

When there is a rise in temperature accompanied by a rise in lymphocytes in a known mastoid infection when other systemic conditions have been ruled out, it may generally be considered that the infection has reached the blood stream. Blood cultures should be taken every twenty-four hours, preferably before the chill and rise in temperature. About 75 per cent of the cases should give a positive blood culture. However, a positive or negative culture should never be the sole determining factor in surgical management of a suspected case.

A daily blood study is of great value in tracing the course of infection and indicating the advisable times for transfusions. Usually the leucocyte count parallels the severity of the infection. Absence of eosinophils indicates a severe systemic infection, and their return is often the earliest favorable sign.

Bacteriological study of drainage from the mastoid, urine, and spinal fluid, as well as of the blood, should be made. Streptoccoccus hemolyticus seems to be most frequently the organism involved.

Medical and surgical treatment may both be effectively used depending upon the case. Transfusion of whole blood frequently and in small amounts is probably the most effective medical treatment. Generally if the hemoglobin content is 60 per cent or below transfusion is indicated. Antistreptococcus serum and mercurochrome have not been effective in the treatment of our cases. Small doses of neoarsphenamine given at weekly intervals have seemed beneficial, and the intravenous administration of saline and glucose is often helfpul.

Surgical treatment consists of removing the primary focus of infection by mastoidectomy; prevention of the spread of the infection by the drainage of the vein involved; and treatment of any metastasis. Our policy is to open the sinus for about an inch, and to drain (never using metalic drainage tubes), and to pack for two or three days only.

Prognosis depends upon the effectiveness of the surgical treatment, the timeliness of the medical treatment, together with careful postoperative observation, avoidance of over-exertion, exposure to cold, and general hygienic measures. Death may result from emboli in the lungs or elsewhere, meningitis, pneumonia, and general toxemia.

The cases cited were of school children under nine years of age—all with streptococcus hemolyticus infections. They received a combination of surgical and medical treatment, and all except one recovered.

Sensitivity to Fungi in Infantile "Eczema." Lewis Webb Hill, M.D., Boston, Mass. American Medical Journal, Vol. 103, No. 5, Pages 331-334.

There are many factors in etiology in so-called "Infantile Eczema" and there is no clear understanding of the disease. In the past few years fungi have been mentioned more as the causative factor in many skin diseases.

Monilia albicans is frequently found associated with deep crusty and scaley type of skin lesions involving the trunk, inner sides of thighs and scalp in a high percentage of cases of infantile eczema, and when an intradermal injection of 1-10 cc. of a

1-100 dilution of an extract of a pathogenic strain of monilia albicans causes an area of induration and redness similar to the positive reaction in the tuberculin test, after forty-eight hours, you can be quite certain that the fungi is the exciting agent.

If the reaction is positive the treatment is quite different than that due to food allery and other unknown causes, hence all cases of eczema should be given the monilia albicans intradermal test.

It is a very easy and simple procedure. The reaction occurs forty-eight hours following the injection and remains several days.

Thymic Dangers. Roy E. de la Houssaye, M.D., New Orleans, La. Southern Medical Journal, Vol. 27, No. 8, August, 1934, Pages 694-698.

The thymus gland at times constitutes a real danger to the infant, and should receive prompt treatment.

The gland arises from the third bronchial pouch, and lies in a compartment of the cervical fascia of the mediastium. It is a lymphoid structure which gradually disappears, and its function is very obscure.

Several case histories of children who developed symptoms associated with an enlarged thymus, such as cyanosis, head retraction, dyspnea, and syncope, demonstrate that enlarged thymus glands may be a definite menace. Roentgenograms showed enlarged thymus glands in each of these cases and they responded satisfactorily to Roentgen ray and radium therapy.

Each of these types of treatment has its dangers. It is difficult to administer Roentgen ray because it is difficult to hold the child in an exact position. Administering the ray to the wrong area would be useless and often dangerous. Radium therapy should be used only by those thoroughly familiar with it. A slight deviation in the distance from the skin makes a great difference in the dosage and effect of the element. However those who have used both Roentgen ray and radium prefer the latter because in competent hands it can be administered effectively without pain or alarm to the patient.

Dr. Houssaye considers the term status lymphaticus comparable, if not inferior, to the old inquest verdict, "died by the visitation of God," and prefers "cause unknown" as an explanation of death to a term whose indentification is so unscientific.

HUGH JETER

Mercury Poisoning. S. M. Rosenthal, M.D., Washington, D. C. J. A. M. A., Vol. 102, No. 16, P. 1274.

"It has thus been established that: (1) Sulphoxylate is a compound of low toxicity that can persist in the body for several hours after intravenous injection, in concentrations that confer on the blood the ability to reduce corrosive mercuric chloride to insoluble mercurous compounds, which are known to be considerably less toxic; (2) when injected intravenously the major part of the sulphoxylate is excreted in the urine within a few hours, which means that high concentrations are reached in the kidneys; (3) following oral administration in sufficient quantities sulphoxylate can persist throughout the gastrointestinal tract so that it can render local protection and also reduce to insoluble compounds any unabsorbed mercury that may be present; (4) a high percentage of dogs can be saved from a fatal oral dose of corrosive mercuric chloride and can be protected against renal injury if oral and intravenous therapy is given within an hour and a half after the poisoning.

"I have had occasion to administer this therapy in ten cases of corrosive mercuric chloride poisoning in human beings. The results have been confirmatory of the experimental observations and justify a report at this time in order that this therapy may be given wide spread clinical trial."

Comment: This comparatively inexpensive drug (sodium formaldehyde sulphoxylate) is available and seems deserving of a clinical trial as suggested by the author. As a strong reducing agent it is supposed to reduce corrosive mercuric chloride into insoluble and less toxic mercurous salts and to metallic mercury. The low toxicity of the drug seems to be satisfactorily established.

Small Intestinal Intubation: Experiences with a Double-Lumened Tube. T. Grier Miller, M.D., F.A.C.P., and W. Osler Abbott, M.D. Annals of Internal Medicine, July, 1934.

"Several workers have accomplished small intestinal intubation in man. McClendon and his associates, in 1920, reported on the hydrogen ion concentration of the contents aspirated from two subjects, but their technic required four days for the tube to reach a level at most four or five feet below the pylorus. None of their methods has led to extensive investigation or important results. Recently, however, we have developed a technic that seems practical, and that, we believe, may eventually be applied in a more or less routine fashion.

"We have introduced the tube into the small intestine for a distance of 100 cm. or more in seventy-five persons, doing in all more than 100 intubations. At first we failed in about 50 per cent of the attempts, due chiefly to inability to traverse the pylorus within a reasonable time, but, since using the Morgenstern technic, have been successful in fully 80 per cent. In no instance with the balloon deflated, have we had any difficulty in removing the tube by mouth. Some of the subjects have been ward or out-patients; others, unemployed individuals to whom we paid small fees.

"Thus we have referred to various experiences with a new method of studying the secretory and motor functions of the human small intestine to indicate the value of the technic, and have presented certain data that confirm results obtained previously only by animal experimentation. It is believed that further experience will lead to simplification of the technic, making it available eventually for the study of pathologic conditions of the small bowel."

Comment: These investigators have used a double-lumened tube capable of being visualized by the x-ray, and which will furnish evidence of motor and contemporary chemical function. The fact that the entire extent of the small intestine of the human can be thus studied, surely will yield valuable information, as to normal as well as pathologicial function of the intestinal tract.

Carcinoma of the Pancreas. Ford K. Kick, M.D., and Harold M. Mortimer, M.D., Chicago, Ill. J. of Laboratory and Clinical Medicine, Vol. 19, July, 1934, No. 10.

"In an attempt to determine the frequency and symptomatology of carcinoma of the pancreas we have reviewed fifty cases proved at autopsy, seen during the period from January 1, 1925, to January 1, 1933. The records are from the Cook County

Hospital, and a smaller number are from the Research and Educational Hospital. The majority of the autopsies were performed by Dr. R. J. Jaffe, pathologist at the Cook County Hospital. Clinically diagnosed cases, even those confirmed by laparotomy but not proved by necropsy, are omitted because of the great difficulties in diagnosis. Metastatic carcinoma of the pancreas is not mentioned.

"1. Primary carcinoma of the pancreas comprises 5.3 per cent of all carcinomas. It occurs one-fourth as frequently as carcinoma of the stomach.

"2. Carcinoma of the body and tail is as common as carcinoma of the head of the gland.

"3. The most frequent symptoms of carcinoma of the pancreas are pain, weight loss, anorexia, jaundice, and nausea with vomiting. Diarrhoea is quite rare.

"4. Carcinoma of the head of the pancreas produces in three-fourths of the cases a progressively intense, moderately painful jaundice due to obstruction of the common bile duct. This cannot be differentiated from carcinoma of the biliary passages, a much more common lesion.

"5. Carcinoma of the body or tail of the pancreas may be a presumptive diagnosis in the patient who is suspected of having an intra-abdominal malignancy and who presents boring epigastric and upper lumbar pain partly relieved by postural changes, provided that no other primary tumor can be demonstrated. The presence of diabetes further supports this diagnosis.

"6. The early occurrence of widespread metastases and the rapid progress of the disease make the treatment purely palliative."

This is an interesting study of pancreatic carcinomata. G. Gordan Taylor of London, England, in the Annals of Surgery, July, 1934, also makes an interesting report on the surgery of cancer of the pancreas and reports a case which was satisfactorily operated.

The University Hospital of Oklahoma City, Oklahoma, has from July, 1921, to July, 1934, had 1343 carcinoma cases, of which forty-four cases or 3.28 per cent were thought to be primary in the pancreas.

BOOKS RECEIVED

DISEASES OF THE EYE FOR STUDENTS AND GENERAL PRACTITIONER: By Charles H. May, M.D., Director and Attending Surgeon, Eye Service, Bellevue Hospital, New York, 1916 to 1926; Consulting Ophthalmologist to the Mt. Sinai Hospital, to Bellevue Hospital, to the French Hospital, New York, and to the Monmouth Memorial Hospital; formerly Chief of Clinic and Instructor in Ophthalmology, College of Physicians and Surgeons Medical Department, Columbia University, New York. Fourteenth Edition, Revised. 376 Original Illustrations, including 25 Plates, with 78 Colored Figures. William Wood & Company, Baltimore, Md., 1934. Price $4.00, Cloth.

DISEASES PECULIAR TO CIVILIZED MAN, Clinical Management and Surgical Treatment: By George Crile, M.D. Edited by Amy Rowland. The Macmillan Company, New York, 1934.

THE DANGEROUS AGE IN MEN: A Treatise on the Prostate Gland: By Chester Tilton Stone, M.D. The Macmillan Company, New York, 1934.

THE SURGICAL CLINICS OF NORTH AMERICA: Chicago Number, Volume 14, Number 4, August, 1934. W. B. Saunders Company, Philadelphia.

SURGERY OF A GENERAL PRACTICE: By Arthur E. Hertzler, M.D., Chief Surgeon, Halstead Hospital; Professor of Surgery, University of Kansas, and Victor E. Chesky, M.D., Chief Resident Surgeon, Halstead, Kansas. 472 Illustrations. Cloth $10.00. C. V. Mosby Company, St. Louis, 1934.

MODERN CLINICAL SYPHILOLOGY: By John H. Stokes, M.D., Duhring Professor of Dermatology and Syphilology, University of Pennsylvania; Member, Commission on Syphilis and Cognate Diseases, League of Nations Health Organization. Second Edition, Revised & Entirely Reset. 1400 pages with 973 illustrations and Text Figures. Philadelphia and London: W. B. Saunders Company, 1934. Cloth $12.00 net.

A PRIMER FOR DIABETIC PATIENTS. A Brief Outline of the Treatment of Diabetes with Diet and Insulin, Including Directions and Charts for the Use of Physicians in Planning Diet Prescriptions: By Russell M. Wilder, M.D., Professor and Chief of the Department of Medicine of the Mayo Foundation, University of Minnesota; Head of Section on General Metabolism, Division of Medicine, the Mayo Clinic. Fifth Edition, Reset. 172 pages. Philadelphia and London: W. B. Saunders Company, 1934. Cloth, $1.75 net.

SPINAL ANESTHESIA, Technic and Clinical Application: By George Rudolph Vehrs, M.D., Salem, Oregon. Illustrated. The C. V. Mosby Company, St. Louis, 1934. Price $5.00.

A TEXTBOOK OF GYNECOLOGY: By Arthur Hale Curtis, M.D., Professor and Head of the Department of Obstetrics and Gynecopoly, Northwestern University Medical School; Chief of Staff and Chief of the Gynecological Service, Passavant Memorial Hospital, Chicago. Second Edition, Reset. 493 pages with 300 original illustrations, Chiefly by Tom Jones. Philadelphia and London: W. B. Saunders Company, 1934. Cloth, $6.00 net.

A TEXT-BOOK OF HISTOLOGY: By Alexander A. Maximow, Late Professor of Anatomy, University of Chicago, and William Bloom, Associate Professor of Anatomy, University of Chicago. Completely revised with 662 pages with 530 illustrations, some in colors. Philadelphia and London: W. B. Saunders Company, 1934. Cloth, $7.00 net.

THE MODERN PHYSICIAN SURVEYS THE ECONOMIC CHANGES

Today the age-old and venerable profession is confronted by myriads of problems and changes in economies. Many physicians are now faced with a new trend in economic pressure that has been brought about by the telephone, automobile, radio and the industrial age with complicated machinery. The world-wide depression has so wounded the standard of living of the doctor that it will take many years to heal.

Some of the existing conditions which have un-

derminded the doctor's income at present are as follows: Private business corporations use as their keyword to the doctor, when solicited, that their products are only advertised to the practicing physician. After the commercial products have been popularized through the medical man's prescriptions, the promises of these money making corporations are forgotten. Subsequently, these companies begin advertising campaigns over the radios and, by a series of advertisements in all sorts of periodicals, never forgetting to mention that the medical profession encourages its use. The city physician has developed a poor habit of writing patent medicines because it helps him to save time by not having to calculate the dosage of all the ingredients. Patients, however, rapidly lose confidence in such practices and soon they learn to ask for such medications over the counter of the drug store. Then we have the unscrupulous advertisers over the radio through which channels much incorrect information is given to the public by quacks who either run their own clinics or are highly paid by commercial enterprises.

The physician, as a rule volunteers without charge to treat deserving poor patients in dispensaries, but the hospitals, however, do not have adequate social service assistance to investigate those who do not deserve charity. Nevertheless, there is unfairness on the part of a good number of hospitals in not protecting the physician's economic status.

At times the medical profession is exploited by several small private incompetent health insurance companies which work on a basis of profit. The companies of varied sources offer doctors very small annual fees and in return large numbers of families are attended by the overworked and underpaid poor physician who usually does very inferior type of work because of the tremendous amount of petty responsibilities. Also, there are numerous societies, lodges and endless benevolent and fraternal organizations which work on the very same principles and the helpless doctors fall for such insignificant tactics. There are numerous other causes which limited space does not permit the writer to mention at this time.

There are various groups and cults taking advant-

REPORT OF EXAMINATION FOR LICENSES TO PRACTICE MEDICINE

Examination held at State Capitol, Oklahoma City, June 6th and 7th, 1934. The following applicants passed:

Name	Year of Birth	Place of Birth	School of Graduation	Year of Graduation	Home Address or Previous Location
Mishler, Donald Lloyd	1904	Centerville, I.	Listie, Penn.	1929	Tulsa, Okla.
Morgan, Wm. Gregory	1901	Bedford, Ky.	Univ Iowa	1927	Holdenville, Okla.
Morris, Myron Louis	1888	New York, N. Y.	Univ of Louisville	1913	Hugo, Okla.
West, Charles I. Jr., (Col.)	——	Washington, D. C	Bellevue Hos Med	1933	Tulsa, Okla.
Cox, C. P.	1873	Ft. Blackman, Va.	Howard Univ	1898	Ninnekah, Okla.
*Coppedge, Orville N.	1902	Jennings, Okla.	Louisville Med.	1933	Bristow, Okla.
*Jobe, Virgil Ro	1902	Lincoln, Ark.	Univ. of Okla.	1933	Muskogee, Okla.
*Reed, Karl Asbury	1902	Guthrie, Okla.	Univ. of Okla.	1933	Okla. City.
*Shiflet, Albert Woods	1906	Lebanon, Mo.	Univ. of Okla.	1933	Okla. City.
*Bard, Thomas John	1910	Merkel, Tex.	Univ. of Okla.	1933	Norman, Okla.
*Sturm, Charles Edward	1905	Marysville, Mo.	Univ. of Okla.	1933	Okla. City
*Tisdal, Wm. Charles.	1907	Cordell, Okla.	Creighton Univ.	1933	Elk City, Okla.
*Angus, Donald Adelbert	1907	Lawton, Okla.	Univ. of Okla.	1933	Okla. City
*Curb, Delos Griffith	1897	Leon, Okla.	Univ. of Okla.	1933	Okla. City
*Craft, Wilma	1908	Vermont, Ill.	Univ. of Okla.	1933	Okla. City
*Funk, Gustavus DeLana	1904	Maryville, Mo.	Univ. of Okla.	1933	El Reno, Okla.
*Haynie, Weldon Geiller	1907	Aylesworth, Okla.	Univ. of Okla.	1933	Durant, Okla.
*Perry, Fred Thomas	1908	Texas	Univ. of Okla.	1933	Okla. City
*Rogers, Galen Alonzo	1906	Waynoka, Okla.	Univ. of Okla.	1933	Nicoma Park, Ok.
*Traverse, Clifford A.	1908	Byron, Okla.	Univ. of Okla.	1933	Okla. City
*Watson, Price Thorne	——	Erick, Okla.	Univ. of Okla.	1933	Blair, Okla.
*Huggins, James Richard	1904	Chickasha, Okla.	Univ. of Okla.	1933	Okla. City
*Hackler, Harold Waton	1906	Westville, Okla.	Univ. of Okla.	1933	Pryor, Okla.
*Bailey, Carl H.	1909	Ft. Worth, Tex.	Univ. of Okla.	1933	Okla. City
*Hoover, Wilkie Dee	1908	Wynnewood, Ok.	Univ. of Okla.	1933	Tulsa, Okla.
*Luton, James Polk	1907	Lindsay, Okla.	Univ. of Okla.	1933	Okla. City
*Parsons, Orval Loewen	1907	Enid, Okla.	Univ. of Okla.	1933	Okla. City
*Ray, Raymond Gerald	1907	Downs, Kans.	Univ. of Okla.	1933	Tulsa, Okla.
*Smithson, Carl Bryan	1896	Alva, Okla.	Univ. of Okla.	1933	Okla. City
*Lambke, Phil Milam	——	Byron, Okla.	Univ. of Okla.	1933	Okla. City
*Reed, Charles Wesley	1909	Okla.	Univ. of Okla.	1933	Okla. City
*Edgar, Cecil Carl	1904	Canute, Okla.	Univ. of Okla.	1933	St. Joseph, Mo.
*Speed, Henry K. Jr.,	1909	Sayre, Okla.	Baylor Univ.	1933	Sayre, Okla.
*Fryer, Samuel Richard	1910	Muskogee, Okla.	Univ. of Okla.	1933	Okla. City
*Eads, Chas. H .	1903	Mt. Carbon, W. V.	Univ. of Okla.	1933	Tulsa, Okla.
*Butts, Imogene	1909	Holdenville, Ok.	Univ. of Okla.	1933	Holdenville, Okla.
*House, Rex Clayton	1909	Carnegie, Okla.	Univ. of Okla.	1933	Okla. City
*Messenbaugh, Joseph Fife	1911	Okla. City	Univ. of Okla.	1933	Okla. City
*Ford, Harry Cummings	1908	Middletown, Mo.	Univ. of Okla.	1933	Tulsa, Okla.
*Sturgeon, H. Violet	1908	Hennessey, Okla.	Univ. of Okla.	1933	Okla. City
*Russell, Lum Elbert	1910	Cyril, Okla.	Univ. of Okla.	1933	Okla. City
*King, Everett Giddings	1910	Colony, Okla.	Univ. of Okla.	1933	Duncan, Okla.
*Ruth, Weldon Kenneth	1909	Okeene, Okla.	Univ. of Okla.	1933	Okeene, Okla.
Ingles, Anson Benjamin	1875	Navajo, Ariz.	Kansas City Med	1896	Globe, Ariz.
Bynum, Wm. Turner	1910	Okla. City	Northwestern	1934	Okla. City
DeMotte, Mary Alice T.	1902	Phillipsburg,	Washington Univ.	1930	Ponca City, Okla.
DeMotte, John Allan	1904	Kans.	Washington Univ.	1930	Ponca City, Okla.
Hetherington, Lloyd P.	1903	Hopkins, Mo.	Univ. of Neb.	1930	Pawnee, Okla.
Mall, Werner Walter	1905	Atwood, Kan.	Univ. of Neb.	1932	Ponca City, Okla.
Paulson, Alvin Winfred	1907	Clay Center, Kan.	Washington Univ.	1932	Clinton, Okla.
Shorbe, Howard Bruce	1909	Dill Rapid, S. D.	Northwestern	1934	Okla. City
*Peter, Maurice Lyle	——	Coalgate, Okla.	Univ. of Okla.	1933	Okla. City
*Darrough, James Breese	1910	Oxford, Kan.	Univ. of Okla.	1933	Vinita, Okla.
*MacLeod, Sherburne	1906	Vinita, Okla.	Univ. of Okla.	1933	Hooker, Okla.
Kreger, Glenn Smith	1909	May, Okla.	Univ. of Penn.	1933	Tonkawa, Okla.

*Those who took the examination in 1933, but license not issued until internship was completed.

age of the doctors' lack of interest in the welfare of the medical profession, and so these strings of cults are constantly exploiting humans in their misery for their financial gain. The medical societies are weak without the individual physician's interest and understanding, as there must be concerted effort on the part of the medical profession to help solve these problems rather than allow those who are out of the profession to dictate what ought to be done.

Since there is an approach to an oversupply of physicians in this country, there should be proposed a moratorium by the American medical schools which will aid in the equalization of distribution of physicians. Dispensaries should be put out of business if they are of a commercial nature; which can be done by having a state law passed prohibiting commercial dispensaries from making a charge to use clinics or medicines. A specialist or general practitioner should never use patent medicines for prescribing. There are too many age-old, useful drugs in the materia medica and pharmacology textbooks; students now at medical schools should be admonished against the evil practice of patent drugs. The druggists and the physicians should have mutual understandings and never infringe upon each others' fields. Cheap contract lodge practice, either on a small or large scale, is a pernicious, destructive economic force and should not be tolerated by medical societies. In short, the art of medicine has been constructed on basic principles of truth for which men in the past century have fought valiantly. We, too, must try and uphold those very fine principles and ethics which help to make our profession stand out characteristically from all the rest.

—M. Martyn Kafka, M.D.

(Reprint from New York Medical Week, March 3, 1934.)

SERIOUS ARSPHENAMINE REACTIONS WITH REFERENCE TO THEIR PREVENTION: REPORT OF SIX CASES

Maxwell Scarf, Philadelphia (Journal A. M. A., June 30, 1934), reports six cases of serious arsphenamine reactions, in one of which aplastic anemia developed under neoarsphenamine therapy when two injections were given after purpura appeared. In one of two cases of hepatitis, one injection of neoarsphenamine was given after the patient complained of itching. Hemorrhagic encephalitis occurred as a complication in a case of gonorrheal arthritis with a negative Wassermann reaction in which two doses of neoarsphenamine were given in increasing doses, although an eruption followed the first dose. In a case of aneurysm of the aorta, rupture followed neoarsphenamine therapy, which was too vigorous and not preceded by a preparatory course of the milder anti-syphilitic drugs. A case of transverse myelitis, due to a rare and usually fatal form of Herxheimer reaction, terminated in complete recovery. From these reactions the author concludes that a large proportion of fatal or disabling reactions may be prevented by a careful evaluation of symptoms and signs as they appear in syphilitic patients under treatment with the arsphenamines.

The Selection of a Physician

The selection of a physician for an operation or as a family doctor, is usually made with some care. We consult those who have employed physicians and are governed largely by their recommendations. But having selected a physician, we follow his advice. We trust him even to the extent of submitting to operations that may have serious results. The point is, we trust THE MAN WHO KNOWS.

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